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System and Database Review for Deployed Environmental Surveillance System (DESS)

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This report identifies and evaluates databases which are potentially applicable to the development of Deployed Environmental Surveillance System (DESS). The goal of DESS is the tracking of individual exposures of all deployed U.S. personnel. The report will assist in providing a proof-of-concept demonstration of available technologies that will prove the worth of a system assembled to identify CBRN hazards, warn first echelon forces, and transmit exposure data to qualified consultants in real time for evaluation, technical assistance, and personnel exposure tracking.

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LIST OF ACRONYMS

ACC	Air Combat Command
AF	Air Force
AFIERA	Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis
AFMC	Air Force Materiel Command
AFMOA	Air Force Medical Operations Agency
AFPMB	Armed Forces Pest Management Board
AF-SAIA	Air Force-Safety and Inspection Agency
AFTOX	USAF Toxic Chemical Dispersion Model
AGCI	Aspen Global Change Institute
ARIP	Accidental Release Information Program
ATSDR	Agency for Toxic Substances and Disease Registry
BES	Bioenvironmental Engineering Services
BTS	Bureau of Transportation Statistics
C&C	Command and Control
CBRN	Chemical, Biological, Radiological, and Nuclear
CCS	Command Core System
CENTAF	Air Force Central Command
CENTCOM	United States Central Command
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CHCS	Composite Health Care System
CHPPM	Center for Health Promotion and Preventative Medicine
CIESIN	Center for International Earth Science Information Network
CONUS	Continental United States
COTS/GOTS	Commercial off the Shelf/Govt. off the Shelf
CY	Calendar Year
DEIA	Division of Environmental Information and Assessment
DESS	Deployed Environmental Surveillance System
DMED	Defense Medical Epidemiological Database
DMDC	Defense Manpower Data Center
DMSS	Defense Medical Surveillance System
DNA	Deoxyribonucleic acid
DNBI	Disease and Nonbattle Injury
DoD	Department of Defense
DOEHRS	Defense Occupational Environmental Health Readiness System
DoT	Department of Transportation
DPMIAC	Defense Pest Management Information Analysis Center

DTRA	Defense Threat Reduction Agency
DSN	Defense Systems Network
EEA	European Environment Agency
EMIS	Environmental Management Information System
ENSIS	Environmental Surveillance and Information System
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESTO	Earth Science and Technology Organization
ESOH	Environmental, Safety, and Occupational Health
EU	European Union
FLARE	Field Laboratory for the Assessment of Radiation Exposure
FY	Fiscal Year
GCRIO	Global Change Research Information Office
GCCS/GCSS	Global Command and Control System/Global Combat Support System
GEMS	Global Expeditionary Medical System
GIS	Geographic Information System
HLPAD	Hazardous Liquid Pipeline Accident Database
HMIRS	Hazardous Materials Incident Reporting System
HPAC	Hazard Prediction Assessment Capabilities
HQ	Head Quarters
HSEES	Hazardous Substances Emergency Events Surveillance
HSW	Human Systems Wing
IMIS	Integrated Management Information System
IRIS	Incident Reporting Information System
J-4/MRD	Pentagon/Medical Readiness Division
JTF-SWA	Joint Taskforce, Southwest Asia
JWARN	Joint Warning and Reporting Network
MAJCOM	Major Command
Med	Medical
MHS	Military Health System
MOC	Medical Operations Center
MRER	Master Radiation Exposure Registry
MSS	Medical Surveillance System
MTF	Medical Treatment Facility
NBC	Nuclear, Biological, Chemical
NCSA	National Center for Super Computer Application
NEHC	Navy Environmental Health Center
NILU	Norwegian Institute for Air Research

LIST OF ACRONYMS (continued)

NIVA   Norwegian Institute for Water Research
NOAA   National Oceanic and Atmospheric Administration
NPL   National Priorities List
OCONUS   Outside the Continental United States
OSD-HA   Office of the Secretary of Defense-Health Affairs
OSHA   Occupational Safety and Health Administration
PC   Personal Computer
PEM   Patient Encounter Module
PSAB   Prince-Sultan Air Base
RAPID   Rugged Advanced Pathogen Identification Device
ROD   Record of Decision
RSO   Radiation Safety Officer
SEDAC (CIESIN)   Socio-Economic Data Application Center (Center for International Earth Science Information Network)
SF   Security Force
SoE   State of the Environment
TMIP   Theater Medical Information Program
TMST   Theater Medical Surveillance Team
UN   United Nations
UNCED   United Nations Conference on Environment and Development
UNEP   United Nation Environmental Programme
USAF   United States Air Force
USGCRP   United States Global Change Research Program
WDC   World Data Centers
WWW   World Wide Web

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Deployed Environmental Surveillance System
Systems and Database Review

1.0 Introduction and Background

Earth Tech performed an assessment of available information systems and databases potentially applicable to the development of a *Deployed Environmental Surveillance System* (DESS). The work was conducted for the Air Quality and Hazardous Waste Branch, Air Force Institute for Environmental, Safety, and Occupational Health Risk Analysis (AFIERA/RSEQ), under contract number F41624-95-D-9016, Delivery Order 53. The project was conducted for the Air Force (AF) Force Protection Battlelab, Lackland AFB, Texas, from October 2000 to February 2001.

The AF Force Protection Battlelab was formed in 1996 to address innovative force protection concepts involving organization and doctrine, tactics, training, procedures, and equipment; pushing technology via interaction with industry. The Battlelab evaluates innovative force protection ideas and concepts, through a streamlined, standardized process on an 18-month schedule. The Battlelab using this process is evaluating the DESS initiative. The current effort represents one task (database evaluation) in the evaluation process.

Public Law 105-85 requires the Department of Defense (DoD) to monitor all personnel for exposure to chemical, biological, radiological, and nuclear (CBRN) agents and for DoD to protect personnel from these agents during all contingency operations outside of the United States. The Battlelab is evaluating existing technologies that may be employed to improve DoD's ability to monitor and protect forces, particularly first echelon forces, from CBRN agents.

The Battlelab's assessment will result in a proof-of-concept demonstration of available technologies that will prove the worth of a system assembled to identify CBRN hazards, warn first echelon forces of hazardous conditions, and transmit exposure data to qualified consultants in real time for evaluation, technical assistance, and personnel exposure tracking.

The Battlelab's streamlined organization and operating procedures rely largely on the staff and funding of sponsor and collaborating organizations to evaluate new force protection concepts. AFIERA has been a collaborator in the DESS Initiative, while the primary sponsor will likely be Air Combat Command (ACC). ACC is also pursuing other advances with exposure tracking and reporting, involving medical and environmental databases. These initiatives have application both for fixed airbases and forward-deployed operations. One concern expressed by ACC for the DESS initiative is that DESS be compatible with the major surveillance systems currently deployed, primarily the Global Expeditionary Medical System (GEMS) and the Command Core System (CCS).

This report summarizes Earth Tech's investigation and review of databases available to the Air Force, or being developed for the Air Force, for storing and retrieving comprehensive environmental and occupational health information. Earth Tech also reviewed the capabilities and weaknesses of the databases for storage and remote retrieval to determine how the databases might be linked together and subsequently back to a rear echelon consultant. Earth Tech also considered the security classification of the databases. This technical report and an accompanying briefing detail Earth Tech's findings of the investigation.

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2.0 Technical Approach

To accomplish the Statement of Work tasks, Earth Tech utilized the following approach:

2.1 **Kickoff Meeting.** Earth Tech participated in a meeting held on October 3, 2000, at the Battlelab's Lackland AFB facility. The meeting was hosted by the Battlelab's DESS Initiative Manager, and by staff from numerous divisions from AFIERA. At this meeting, overviews of each organization and their deployment surveillance activities were presented. The scope of the DESS Initiative and the database assessment task were also discussed in more detail.

2.2 **Database Identification and Evaluation.** Earth Tech personnel collected information on the systems identified as potentially applicable during the October meeting, and on additional databases/systems identified during the information collection process. The process consisted of the following:

- *Internet search for system information.* This consisted of locating and downloading systems information from system and supporting organization websites.

- *Telephone interviews with system owners/users.* Owners or users of some systems were called to obtain more detailed information on the systems for potential applicability to DESS. Owners/users of the Master Radiation Exposure Registry (MRER) and CCS and GEMS users were consulted.

- *Personal interviews with system owners/users when practicable.* Personal interviews were conducted for certain systems (GEMS, CCS and MRER) where there was only local travel involved.

- *Follow-up calls as necessary to collect pertinent details.* Selected follow-up calls were made during the evaluation to gather additional information needed for the assessment. These were primarily associated with CCS and GEMS.

Report and Briefing Preparation. Earth Tech assembled the results of the information collection phase and prepared a preliminary draft summary report, which was reviewed by AFIERA/RSEQ and key stakeholders from AFIERA and HQ ACC. The initial draft report was intended to elicit comments on the additional details necessary to deliver a complete draft report addressing the requirements of the Battlelab's database task in the DESS Initiative, to offer a brief assessment of the available commercial-off-the-shelf and government-off-the-shelf (COTS/GOTS) systems, and to offer an assessment of possible schematics for an ultimate operational DESS.

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3.0   Systems Identified

The databases and systems identified were broken into two categories, ENVIRONMENTAL and MEDICAL. Those systems that address both environmental and medical exposure information (e.g., Command Core) were put in one category or the other. Summary information on each of the systems in the two groups is presented in Table 3.1 and Table 3.2, respectively.

In Appendices A and B, pertinent information on each system is presented on a one-page form. Following each form, supplementary information from the Internet and other sources is presented for each system.

Additional information from what is presented in this draft report can be collected for systems that may be considered important for inclusion in a demonstration project.

3.1   Environmental Systems

Earth Tech identified 15 systems potentially applicable to DESS which we put in the "Environmental" category. With the exception of the Armed Forces Pest Management Board (AFPMB) database, none of these systems belong to the DoD. DoD has tested a commercial CBRN database, COBRA, for potential use in personnel exposure tracking. While not specifically addressed in this study due to difficulties in contacting system owners or evaluators, COBRA should be evaluated as a potential component of a DESS.

Ten of the systems are maintained by other United States governmental agencies, including the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Agency for Toxic Substances and Disease Registry (ATSDR), and the Department of Transportation (DOT). These databases serve specific concerns related to the programs of the supporting agencies, such as to provide summary information on regulated waste sites, transportation and pipeline accidents, and regulatory actions. Data from these sites are limited to the geographic areas of responsibility of the governmental agencies. As a result of the specificity of purpose of these databases, and the geographic coverage to include only continental United States (CONUS) and outside-CONUS (OCONUS) U.S. territories, their potential utility for use in tracking exposures of military personnel is extremely limited. Some of these U.S. government systems, however, may be useful as an adjunct tool to a DESS in that they offer reference information on health effects from environmental contaminants that may be encountered in a deployed environment. These potential uses are annotated for applicable systems in Table 3.1.

The AFPMB database is presently used to disseminate pest management and vector information to the DoD. Its potential applicability to a DESS is probably indirect, as a pre-deployment source of potential exposure intelligence. It is also a useful reference for corrective measures for problems with pests, pesticides, ecological information, and related issues that may be encountered during a deployment.

The remaining four systems are international in scope. One, *AirBase*, tracks atmospheric air quality for participating European countries. *Infoterra* and *Mercure* are overseen by the *United Nations Environmental Programme (UNEP)*, and are intended to provide global environmental quality data to the public and planners of developing nations. The fourth, *Center for International Earth Science Information Network (CIESIN)*, contains a variety of international environmental quality data and interactive applications including Geographic Information Systems (GIS) applications. These databases and systems are generally available to the public via the Internet. The sources of input data are varied, and as such there is no centralized quality control of the data in terms of collection methodology, analytical methodology, data validation, or review of input accuracy. In addition, system owners or the organizations that collected the data hold control of the data in these systems. It may be possible for the Air Force to maintain security of Air Force-collected data and utilize these systems to analyze the data, but the systems do not perform all of the functions required of a DESS (e.g., link environmental conditions to individual exposure, interact with medical information systems, etc.). Additionally, as only one user, the Air Force would not be able to direct availability of and changes to these systems and program applications owned by others. As a result, none of these international systems are recommended for incorporation into DESS. The systems may be useful, however, as one source of intelligence regarding environmental conditions in areas where U.S. force

deployment is being considered, and for baseline or trend comparisons to information collected through Air Force environmental surveillance efforts.

3.2   Medical Information Systems

The study identified and evaluated eight database/systems that we classified as "medical" systems. All eight are DoD systems, and seven are in use or have been evaluated for potential deployment. The other system, the *Theater Medical Information Program* (TMIP), is in an early stage of development. Of the seven developed systems, the Defense Occupational and Environmental Health Readiness System, Industrial Hygiene module (DOEHRS-IH), had not been fielded at the time of information collection for this effort; and the *Joint Warning and Reporting Network* (JWARN) has been field-tested but not yet deployed.

The Command Core System (CCS) is currently fully deployed in the Air Force, and is designed to work both with environmental and occupational programs. CCS will in 2001 have a field-ready version, CCS-Forward, which can be installed on a laptop for forward locations. CCS has been designed to interface with the Global Expeditionary Medical System (GEMS), which is also currently deployed in the Air Force and is used to manage patient information. Both of these systems are being developed and supported by the Air Force, which promotes the capability of incorporating both into an Air Force-led DESS.

JWARN is a deployable system that can provide environmental exposure data and transmit the information in real time to a central point in the field. Such a system can serve as a front-end device that can feed exposure information into DESS.

The Master Radiation Exposure Registry (MRER) has maintained all Air Force personal radiation exposure data since the 1960s. The Air Force is developing an interface between MRER and CCS. MRER can be used to manage and archive radiation exposure data with DESS as it is presently used today. In addition, a field system of personnel radiation detection/warning/exposure determination, similar to the JWARN concept, is planned for testing in 2001.

The Composite Health Care System (CHCS/CHCS II) and the Defense Medical Surveillance System (DMSS) are comprehensive personnel medical records management and archival systems supported by DoD. DESS, as a real-time exposure assessment and decision-making tool, could periodically transfer medical and exposure data to one of these systems for long term record keeping. Global Combat Support System (GCSS) is another potential candidate for an exposure data registry. The ultimate repository of personnel exposure data would be determined by the system used by DoD or an individual service for this purpose. DESS would need to be designed to report the data in a format compatible with the ultimate receiving system.

The Defense Manpower Data Center (DMDC), which is already linked to DMSS, may serve as an interim means of associating personnel with deployment locations and assignment dates. Deployment data are presently limited and there are some quality issues associated with the data.

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Table 3.1. Environmental Database Summary

Category	Database Name	Description	Purpose	Pros	Cons	Customers	Data Range of Data	Access Method	Platform	Operating System	POC/Office Symbol – Funct. Owner	Notes
Env	AirBase	Air quality data from participating European countries	Air quality information system for the EEA	Populated database	Limited geographical representation	European Environment Agencies, Health Services	Unknown	Accessible through the Internet	PC Based	AirView	European Centre on Air Quality www.etcaq.rivm.nl/databases/airbase.html	Potential baseline data for European deployments
Env	Armed Forces Pest Mgmt. Board	Disseminates pest mngt. and vector info to DoD	Information/ communication service of the AFPMB	Populated database	Unknown Compatibility	Public Health Pest management, Civil Eng.	1982-present	Authorized access only	PC Based	Any with Internet Browser	AFPMB www.afpmb.org	Potential reference source for DESS.
Env	CERCUS[3]	Data on HW site assess. & remediation	Official repository for CERCLA data	Populated database	US only	US Regulators, Public, Govt Agencies, Commercial	1983-present	Accessible through the Internet	Oracle-based	Any with Internet Browser	U.S. EPA www.epa.gov/enviro/html/kercla	N/A
Env	CIESIN[2]	Collection of environmental info and applications	Data center for human interaction in the environment	Populated database	Unrestricted user access; Limited geographical representation	International Agencies/ Organizations	1989-present	Accessible through the Internet	PC Based	Any with Internet Browser	Columbia University www.ciesin.org	N/A
Env	ENSIS[1]	Assess state of env; overview pollut. sources	Mgmt/decision sup. System for env. issues	Populated database GIS Linked	Unrestricted user access Limited Geographical Data Set	Researchers; government agencies	Unknown	Accessible through the Internet	Oracle-based	Windows NT	NIVA www.niva.no/ensis	N/A
Env	HazDat	ATSDR release/health effects	Info on release of haz subst; info on human health effects	Populated database	Unrestricted user access CONUS plus OCONUS U.S. territories Info from CERCLA only	US Regulators, Public, Govt Agencies, Commercial	Unknown	Accessible through the Internet	PC Based	Any with Internet Browser	ATSDR www.atsdr.cdc.gov/hazdat.html	Potential reference source for DESS.
Env	Infoterra	Global env info exchange network for the UNEP	Promote dev of national/reg capacities in env data/info management	Populated database	Limited geographical representation	Researchers, Private Organizations	1972-present	Accessible through the Internet	PC Based	Any with Internet Browser	UNEP (254 2) 62 4299 infoterr@unep.org www.unep.org/infoterra	Under Construction
Env	Mercure	16 earth stations which provide global telecomm via Intelsat system	Increased internal comm/ user's access to UNEP env information	Populated database	Limited geographical representation	UNEP	1994-present	Accessible through the Internet	UNEP Internet	Any with Internet Browser	UNEP www.unep.org/unep/eis/eis/mercure	N/A
Env	ARIP[4]	Info on accidental releases of haz chemicals at fed facilities	Spill/Release info from US facilities only	Populated database	US only	Regulators, Commercial, Environmental Organizations	1986-present	Accessible through the Internet	PC Based	Any with Internet Browser	U.S. EPA 202-260-3842 www.epa.gov/ceppo/ds-epds.htm#arip	4,800 verified reports since 1986
Env	ERNS[5]	Info on all hazardous substance releases in US	Spill/Release info Database from US facilities only	Populated database	US only	First Responders, Regulators, Commercial, Shipping	1986-present	Accessible through the Internet	PC Based	Any with Internet Browser	U.S. EPA www.rtk.net 202-260-2342	300,000 notification reports since 1986
Env	HLPAD[8]	DOT pipeline information	Spills/releases/ fires/ explosions from pipelines	Populated database	US only	Pipeline Industry	1985-present	FOIA Access Only	N/A	N/A	U.S. DOT 202-366-4569 www.dot.gov	2,000 reports since 1985
Env	HMIRS[7]	DOT spill release database	Spill release info from transportation accidents	Populated database	US only	Transportation Segment	1971-present	Assisted Searches Only	N/A	N/A	U.S. DOT 202-366-4555 www.dot.gov	220,000 accidents since 1971
Env	HSEES[10]	Public health consequences of haz subst releases	State Health Department/ ATSDR public health info	Populated database; limited access	US only	State Health Departments, Public	1990-present	No Public Access	N/A	N/A	ATSDR 404-639-6203 www.atsdr.cdc.gov/HSEES	11,000 releases since 1990
Env	IMIS[9]	In-house OSHA tracking	OSHA enforcement	Populated database	US only	OSHA, State OSHA Agencies		No Public Access	N/A	N/A	OSHA 202-219-7008 www.osha.gov/cgi-bin/ohgihglic1	100+ annually
Env	IRIS[4]	Info on human health effects from chemical exposure	Use in risk assessments, regulatory, etc.	Populated database	US only	First Responders, Regulators, Commercial	1982-present	Accessible through the Internet	PC Based	Any with Internet Browser	National Response Center 202-267-2185 www.epa.gov/ngispgm3/iris	330,000 incident reports since 1982

[1] Environmental Surveillance and Information System
[2] Socio-Economic Data Application Center (Center for International Earth Science Information Network)
[3] Comprehensive Environmental Response, Compensation, and Liability Information System
[4] Accident Reporting Information System
[5] Emergency Response Notification System
[6] Accident Release Information Program
[7] Hazardous Materials Incident Reporting System
[8] Hazardous Liquid Pipeline Accident Database
[9] Integrated Management Information System
[10] Hazardous Substances Emergency Events Surveillance

Table 3.2: Medical Database Summary

Category	Database Name	Description	Purpose	Pros	Cons	Customers	Date Range of Data	Access	Platform	Operating System	POC/ Office Symbol	NOTES:
Med	CHCS/ CHCS II[7]	Medical and dental info system for each military health system (MHS) Beneficiary	Maintain and manage MHS patient records	In use; interfaces with DOEHRS-IH	No environmental; Compatibility w/ GEMS and CCS	Medical Treatment Facilities; Administrators	Unknown but substantial coverage	Authorized users only; privacy act data	PC	Unknown	LTC Brad Drewlus OSD/HA 703-681-7143 cba.ha.osd.mil	104 sites, 32,000 workstations
Med	Command Core System	Relational Database that integrates med, env, log, safety in support of ESOH decision making	Integrates med, env, log, safety areas supporting ESOH decision-making process	Populated database; limited access	No primary database, only individually-linked databases	Flght Medicine; Public Health; Phys Exams; BES	Limited only by date of inputted data	Secure FTP Access	PC (Windows)	Oracle-based	Owner: HQ ACC/ SGOP Tech Support: Maj Dezell AFIERA/RSEC DSN 240-6682 www.commandcore.com	Deployed to 100% of AF installations ;GIS applications are under development
Med	DMSS[4]	Comprehensive military health surveillance system (DoD-wide)	Collect, integrate, store, analyze, report, & transmit data to track force health	Currently Operational; Tri-Service Use	Data not linked to individuals; Different data sets updated at different frequencies	Medical Treatment Facilities	Unknown	Authorized users only	PC	Unknown	LTC Mark Rubertone, MD, MPH 6900 Georgia Avenue, N.W. Washington, D.C. 20307-5001 (202) 782-0471 (DSN: 662) (202) 782-0612 (DSN: 662) sunsaweb@amsa.army.mil	N/A
Med	DOEHRS-IH[6]	Global Info Management system for collection and dissemination of IH info	A modular robust system easily customized, enhanced, maintained, and upgraded	Interfaces with CHCS II	System not complete	Med treatment facilities; BES; Public Health	Unknown	External access yet to be defined	PC	MS Access[6] Interface	DOEHRS USACHPPM Bill Monk 410-436-2926 dohrs.www.apgea.army.mil	Replaces OHMIS; 547 installations planned with 8-10 workstations each
Med	GEMS[1]	Module-based database for Medical C&C eval/decision-making process	Integration of patient eval & epidemiological anlysis	Accounts for Theater Deployments; Populated database; limited access	Doesn't Handle Env. Data; Limited Use	Medical Treatment Facilities; Public Health; AFIERA	Unknown	Controlled Access	Hand-held palm unit; PC	Windows	HQ-ACC/SG LTC Dooley www.sg.langley.af.mil/ows-bin/wbcgiw.cmd/sg	Currently used for theater DNBI tracking.
Med	JWARN[5]	Joint Services NBC information system	Real-time operational capability for NBC-related info	Real time data; Compatible with Joint services Systems	Unknown compatibility with GEMS and CCS; Not linked with personnel in potential exposure area	Forward personnel	Unknown	Potentially Classified Data	PC	Windows, UNIX (Army only)	Mr. Don Ramer 760-725-2599 www.sbccom.apgea.army.mil/products/jwarn.htm	Field Demonstrated in 2000.
Med	MRER[3]	USAF Master Radiation Exposure Registry	Documents personnel radiation exposure history	Populated database	Time Consuming Reporting Back to RSO; QC Difficult	Flght Medicine; BES; RSO	1960s-present	Internet Access	Pocket dosimeters for first response personnel; suitcase sized	MS Access[6] Interface	Lt Ackenbach AFIERA/SDRD 210-536-5573 sg-www.satx.disa.mil/iera/sdr/sdrd.htm	Has 7.6 million records; Will be linked to CCS; USAF-wide, 1000 badges/day evaluated
Med	TMIP[2]	Relational Database that integrates med, env, log, safety in support of ESOH decision making	Integrate/dev med information systems in all theater echelons	Comprehensive Information include; Immunization Tracking; Reference Componet	Not Currently operational	Med C&C; Med logistics; Patient moves; hlth care dlvry, manpower; personnel; training; resources	None (Not currently operational)	Unknown	Unknown	Unknown	HSW/YAM tmip.hrs.osd.mil	Tri service Participation Planned if fielded

[1] Global Expeditionary Medical System
[2] Theater Medical Information Program
[3] Master Radiation Exposure Registry
[4] Defense Medical Surveillance System
[5] Joint Warning and Reporting Network (Phase I)
[6] Defense Occupational Health Readiness System
[7] Composite Health Care System

4.0 Potential DESS Scenarios

A DESS scenario involves the systems necessary to collect exposure information, record that information, and transmit the information to users and decision-makers. DESS is concerned with personnel participating in contingency operations outside the United States, especially those personnel associated with first echelon forces who deploy without substantial accompanying medical, logistical, and other support. The Air Force would need to consider the applicability of DESS to monitoring personnel exposure during various types of contingencies (e.g., humanitarian operations, Military Operations other than War). While not addressed in this study, the Defense Manpower Data Center's deployment personnel database may provide meaningful interpretive information in evaluating exposures. This is potentially applicable both in real-time evaluations and in longer-term investigations involving archived personnel data.

4.1   Basic Schematic for DESS

The basic DESS scenario includes collecting exposure data, assembling the data into an information system, transmitting the data to others, having the tools to analyze and interpret the data, and generating information reports that are transmitted to the affected individuals, decision-makers, and to a repository where the information may be utilized in future analyses.

Figure 4.1 illustrates a simplified structure showing the components of one likely DESS configuration. The three ovals on the left-hand side of the page represent the surveillance data collection. We have broken these into three categories: environmental surveillance data, Disease and Non-Battle Injury (DNBI) data, and occupational exposure data. While these data collection efforts may overlap, we have separated them in the scenarios for the purpose of concept clarity.

4.2   GEMS/CCS Schematic for DESS

Whether or not there is an "alert-to-warn" feature on the environmental exposure data collection devices, the data would go to an information center. Based on a review of the systems data collected during this effort, we have suggested that GEMS/CCS could be appropriate as an entry point for data from the field.

Figure 4.2 shows the schematic for the GEMS/CCS alternative. GEMS is presently used at several installations in Southwest Asia to record patient assessment information. From this information, GEMS generates DNBI reports that are forwarded to AFIERA for QC and weekly reporting. GEMS is not presently configured to handle environmental exposure data, but the system may be an appropriate mechanism to enter environmental exposure data related to individual dosimetry or area sampling. Additionally, in theory occupational exposure data could be handled in the same way. Command Core may be a means to interface such exposure data with GEMS.

For first echelon forces, the standard GEMS alternative might not be appropriate. It is likely infeasible for first echelon forces, with limited personnel and equipment, to carry in a fully operational GEMS system. CCS-Forward would contain necessary elements of CCS and GEMS on a laptop to support the needs of first echelon forces. Automated, direct reading and warning-sounding monitoring devices, such as those associated with JWARN and FLARE would be of increased importance to first echelon personnel.

Those installations that utilize GEMS could run periodic reports, frequency determined by threat conditions, to provide on-site analysis of exposure conditions. Data would also be retrieved by or transmitted to consultants for further analysis, report generation, and dissemination.

Transmittal to Rear Echelon Consultants.   Data from GEMS in this scenario would be sent to rear echelon consultants or Centers of Excellence. In our example, we used AFIERA since DNBI data is presently handled this way through GEMS for Southwest Asia operations. AFIERA would provide Quality Control on the data, and would perform analysis and modeling as appropriate. DESS development should include special attention to data QC opportunities such as this, due to the variety of data input points, collection, and entry methods.

Environmental Surveillance Data

DNBI Data

Occupational Surveillance Data

Management System

Rear Echelon Consultant

Analysis & Modeling

Weekly Reports

AD Hoc Reports

Select Clients

Secure Website

Long Term Data Storage

CENTCOM/CC
HQUSAF
HQ AFMOA
OSD-HA
HQ AF, MOC
J-4/MRD
CHPPM
NEHC
AF SAIA

EARTH TECH

Systems and Database Review for DESS

Generic Schematic for DESS

1-01

Figure 4.1

Systems and Database Review for DESS

CSS/GEMS Schematic for DESS

Figure 4.2

1-01

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For situations involving potential unusual exposures, AFIERA might perform fate and transport modeling in real time to provide findings and recommendations back to the field. Potential analysis and modeling tool candidates include Hazard Prediction Assessment Capabilities (HPAC), Defense Threat Reduction Agency (DTRA), USAF Toxic Chemical Dispersion Model (AFTOX), and applications associated with some of the environ-mental systems included in Table 3.1. For routine information, AFIERA would compile periodic reports for email distribution to affected/interested parties, and post this and additional information on a secured website for access by authorized individuals.

Archiving. Periodically, accumulated data should be entered into a system that maintains permanent medical records for military personnel. We envision in this scenario that DMSS, CHCS II, or GCSS (and MRER as appropriate) could function as the archive for these exposure records. Future investigations and analyses could access the historical exposure information for individuals if the need arises.

4.3 Alternative Schematics for DESS

Figure 4.3 shows the generic DESS scenario with the insertion of alternate systems into the various roles. These candidate systems could either replace components altogether, or work independently (i.e., different services could use alternate systems to fulfill particular DESS roles). Potential interoperability of multiple systems would have to be thoroughly assessed prior to committing to such a flexible system. This schematic is intended to identify candidate systems that may be considered for inclusion in DESS.

Systems and Database Review for DESS

Alternative Schematic for DESS

Figure 4.3

1-01

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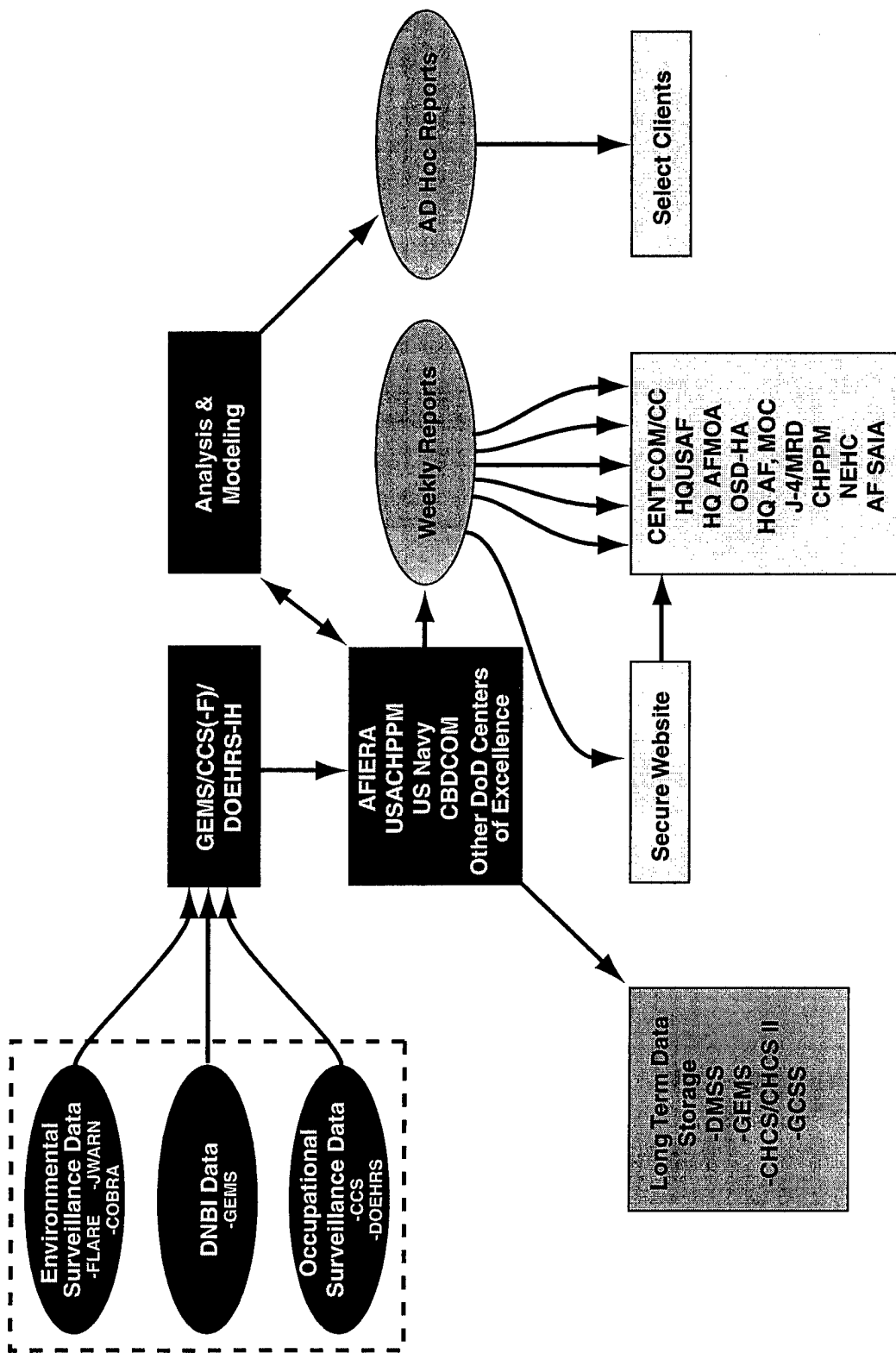
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5.0 Conclusions

There are a substantial number of environmental and medical databases and information systems in use by, available to, or being planned by the Air Force and DoD. Most are service-specific, but even within a single service there are sometimes differences between those systems employed among installations. None are presently used by all services and their Guard and Reserve components. This is a shortfall that will need to be addressed in order to accomplish the DESS goal of tracking individual exposures of all deployed U.S. personnel.

Non-DoD systems, in the environmental data category, are numerous. Most that we identified have been built to serve specific purposes that are not related to individual exposures in regions, but some, such as AirBase and Infoterra, offer some information that may be useful to DoD. Most of this information, however, might be useful as pre-mobilization, regional intelligence. It would not be practical for the military to use these systems to store military-collected information, both from a utility standpoint and from a security standpoint.

We recommend that the Air Force look for DESS alternatives that utilize systems already in use or being developed by DoD. These systems, such as GEMS and Command Core, have been designed with consideration of the goals of Office of the Secretary of Defense-Health Affairs OSD/HA, can be made to work together, will reduce the need for additional systems due to their comprehensive nature and focus on DoD concerns, and are supported by one or more of the services already. These systems can be modified, updated, and enhanced as necessary under the full control of DoD.

Any DESS developed will need to ensure that it will provide adequate coverage for all branches of the active and reserve components.

The existing DNBI tracking and reporting program shows the potential of GEMS to serve as a component of DESS. It is unknown what the requirements would be for enhancing GEMS to accommodate environmental data, although it is not anticipated that a major effort would be required for recoding to accept environmental sample data. Command Core might also be a viable alternative (or GEMS companion) to serve as the DESS component for handling environmental data, as long as the linkage between GEMS and Command Core is sound. Command Core may be the logical point of entry for occupational health exposure data, which may make it more desirable to utilize Command Core for environmental data. The GIS component being demonstrated in CCS strengthens its utility for use as the environmental component of DESS. Additionally, the planned linkage of MRER and Command Core would give CCS another related role in DESS.

Some of the systems identified, such as FLARE, have the ability to track exposure levels and personnel location with associated GPS locations. This detailed information is not used in recording individuals' radiation exposure in MRER, but the collection of such information may be considered to replace or supplement location information tracked in DMDC. The quantity of data associated with individual GPS and exposure information recorded over time may present data transmission difficulties. Additionally, data repositories such as DMSS are not set up to store this type of information.

Environmental data and dosimetry data collection systems planned for first echelon troops should account for a need to upload data into DESS. With DESS gathering data from different echelons and different threat situations, it must be flexible to support varying data input modes.

Quality Assurance/Quality Control (QA/QC) standards would need to be established for each process involved in DESS. These would need to be common for all services and organizations involved. QA/QC functions and tools may be focused on the service center that receives data input, such as the QA/QC role performed by AFIERA in GEMS reporting from Southwest Asia. An overall DESS QA/QC plan should be prepared for a DESS program, and adopted by all users.

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Outline for proof of concept demonstration. A proof of concept demonstration planned for DESS demonstration should include the following features to ensure DESS is viable:

- Continue proof of concept testing for biological, radiological, and chemical detection equipment and software, with attention to DESS data interface
- If an environmental exposure data interface through either GEMS or Command Core is unlikely to be available when detection equipment is tested, plan to record data in a compatible format (e.g., Access) and validate transmittability to higher echelon installation supporting the first echelon forces
- Validate the ability to collect and store area surveillance data, or mobile personnel exposure data, by collecting and recording area and/or personal exposure data tied to Global Positioning System satellite coordinates, and tying this information back to individual exposure data
- System connectivity and operating platform issues can be tested in a demonstration to determine the best combination that will provide quality data collection.

Appendix A
Environmental Systems Information

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AirBase

DESCRIPTION OF DATABASE

AirBase is the air quality information system of the European Environment Agency (EEA). This database contains air quality data for a selection of stations and a number of components, and meta information on air quality monitoring networks and stations.

ACCESS TO SYSTEM

The AirBase database has unrestricted access available through the Internet via the provided Internet address:

www.etcaq.rivm.nl/databases/airbase.html

POTENTIAL DATABASE USERS

☒ Medical Intelligence ☐ Military Intelligence ☐ Forward Echelons

☒ Researchers/Scientists ☒ Public Health (Base Level) ☒ AFIERA

☒ Bioenvironmental Engineering (Base-level) ☐ Medical Command and Control ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Database may provide planning intelligence depending on temporal validity of data. Potential for using data in DESS through downloading. Models may be useful to response personnel/consultants.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ Geographic coverage may include deployment locations ▪ Mechanisms in place for data transfer ▪ Prediction models available	▪ Unrestricted user access ▪ Limited geographical representation of data (e.g., EU only) ▪ Unknown data quality ▪

ENVIRONMENTAL

European Environment Agency
European Topic Centre on Air Quality

Welcome to AirBase, the European air quality information system.

AirBase is the air quality information system of the EEA. It contains a database carrying information submitted by participating countries from across Europe. This information comprises of air quality data for a selection of stations and a number of components, and meta information on air quality monitoring networks and stations. The two preceding EU databases APIS (Air Pollution Information System; air quality data) and GIRAFE (meta information on air quality networks and stations) are now included and replaced.

The AirView web-application facilitates free access to all information contained in AirBase.

The current database contains information which was transmitted by EIONET partner states in the framework of 'Exchange of Information' (EoI) Decisions, or as part of Euro Airnet. To this end the Data Exchange Module (DEM) was designed to facilitate data transmission. The AirBase information system further contains a web-application to facilitate free access to all information contained in the database(AirView), and a Model Documentation System (MDS) providing access to model characteristics for potential model users.

The AirBase information system is developed and maintained by the European Topic Centre on Air Quality on behalf of the European Environment Agency.

AirView | Access engine to retrieve data from AirBase.
DEM | A Data Exchange Module has been developed to manage and transmit meta information on air quality monitoring networks, stations and measurement configurations. DEM can also be used to transmit raw air quality data files, files containing statistics and ozone exceedances.
MDS | Access to the Model Documentation System.
Documented Data | Access to the Documented Data.
Info | AirBase 1998 development status and extensions foreseen.
Status Update | Status of the 2000 EoI/Euroairnet update (1999 data).

Last revised: 7 June 2000

Armed Forces Pest Management Board

DESCRIPTION OF DATABASE

The Armed Forces Pest Management Board (AFPMB) database indexes, analyzes, summarizes, and disseminates information on natural resources management, environmental biology, and the biology, ecology, geographic distribution, taxonomy and control of vectors and pests.

ACCESS TO SYSTEM

Authorized personnel may access the AFPMB database through the Internet via the provided Internet address:

www.afpmb.org

POTENTIAL DATABASE USERS

☒Medical Intelligence	☐Military Intelligence	☒Forward Echelons
☒Researchers/Scientists	☐Public Health (Base Level)	☒AFIERA
☐Bioenvironmental Engineering (Base-level)	☐Medical Command and Control	☐MAJCOM/SG
	☒Theater Medical Surveillance Team	☐Medical Treatment Facilities

DATABASE USE SCENARIOS

Information may be useful if presence of vectors and pests is important in determining potential exposures of individuals. Information access available to deployed personnel for diagnosis consultations.

SECURITY ISSUES RELATED TO THE DATABASE

Authorized users of this database include all DoD medical personnel, pest management and natural resources management, and other DoD staff responsible for dealing with problems generated by disease vectors and pests. Also, eligible are non-DoD members of the AFPMB, and certain personnel of other agencies associated with the AFPMB.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ Restricted access to the database ▪ Technical support available ▪ Tri-service ▪	▪ Unknown compatibility with other systems ▪ ▪ ▪

ENVIRONMENTAL

ARMED FORCES PEST MANAGEMENT BOARD

Defense Pest Management Information Analysis Center

The Defense Pest Management Information Analysis Center (DPMIAC), originally the Military Entomology Information Service, was established in 1962 as the information and communication service of the Armed Forces Pest Control Board, the forerunner of what is now the Armed Forces Pest Management Board (AFPMB). DPMIAC collects, stores, and disseminates published and unpublished information on arthropod vectors and pests, natural resources and environmental biology that is of importance to the Department of Defense.

Authorized DPMIAC users include all DoD medical personnel, pest management and natural resources personnel, and other DoD staff responsible for dealing with problems generated by disease vectors and pests. Also eligible are non-DoD members of the AFPMB, and certain personnel of other agencies associated with the AFPMB.

DPMIAC personnel index, analyze, summarize and disseminate information on natural resources management, environmental biology, and the biology, ecology, geographic distribution, taxonomy and control of vectors and pests. Areas covered include epidemiology and control of vector-borne diseases; stored product pests; structural pests; vector/pest surveillance; chemical and biological control; toxicological information on selected pesticides and other chemicals; poisonous or venomous plants and animals; marine fouling organisms; biology and control of plant pests of turf, forests and landscape; fish and wildlife management; grounds maintenance; and conservation of natural resources.

DPMIAC uses a computerized storage/retrieval system and keywords to index its various topic areas. To facilitate 24-hour service and rapid information dissemination, an answering machine, FAX, computer bulletin board system (BBS), command FAX, and the Internet are on line 24 hours a day.

The current DPMIAC information base includes approximately 250,000 accessions, 180,000 of which are stored in a computer database for rapid retrieval, and a comprehensive reference library of over 1,500 books and 254 periodicals. DPMIAC has established liaison with other federal agencies, libraries, and information systems, including the National Library of Medicine, the National Agricultural Library, the Defense Technical Information Center (DTIC), and the Dialog System managed by Lockheed. If information is not available in-house, it usually can be obtained through these additional sources. As a primary benefit to users overseas or in areas where library facilities are limited, complete copies of articles can be forwarded. When possible, users should attempt to obtain their own hard copies through the nearest library system.

The DPMIAC staff consists of commissioned military entomologists from each branch of the armed services and three civilian entomologists. A civilian technical staff of five provides operational support. Administrative management is provided by the Chief, DPMIAC, under the auspices of the AFPMB, which is a Directorate within the Office of the Deputy Under Secretary of Defense for Environmental Security. Administrative and logistic support is provided by the Secretary of the Army Surgeon General.

CERCLIS

DESCRIPTION OF DATABASE

Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) is the official repository for site and non-site specific Superfund data in support of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA.) CERCLIS contains information on hazardous waste site assessment and remediation from 1983 to the present.

ACCESS TO SYSTEM

The CERCLIS database has unrestricted access available through the Internet via the provided Internet address:

www.epa.gov/enviro/html/cerclis

POTENTIAL DATABASE USERS

☐ Medical Intelligence ☐ Military Intelligence ☐ Forward Echelons

☒ Researchers/Scientists ☐ Public Health (Base Level) ☐ AFIERA

☐ Bioenvironmental Engineering (Base-level) ☐ Medical Command and Control ☐ MAJCOM/SG

☐ Theater Medical Surveillance Team ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ Oracle-based	▪ Unrestricted user access ▪ U.S. only data

ENVIRONMENTAL

CERCLIS
Superfund Overview

Years ago, many wastes were dumped on the ground, in rivers, or left out in the open. As a result, thousands of uncontrolled or abandoned hazardous waste sites were created. Some common hazardous waste sites include abandoned warehouses, manufacturing facilities, processing plants, and landfills. In response to growing concern over health and environmental risks posed by hazardous waste sites, Congress established the Superfund Program in 1980 to clean up these sites. The Superfund Program is administered by the U.S. Environmental Protection Agency (EPA) in cooperation with individual sites throughout the United States.

The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is the official repository for site and non-site specific Superfund data in support of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It contains information on hazardous waste site assessment and remediation from 1983 to the present.

The Superfund Query Form and the Envirofacts Query Form provide access to Superfund National Priorities List (NPL) Factsheets, Record of Decision (ROD) documents, and CERCLIS Site Reports. These documents are maintained by the Superfund Office.

The reports contain the following categories:
- Site information Including: Site Name, Street, City, State, Zip, EPA ID, EPA Region, County, Latitude, Longitude, NPL Status, Federal Facility Flag and Incident Category
- Actions
- Aliases
- Op Units
- Financial
- Record of Decisions

On-Line Superfund Products

CERCLIS reports can be accessed on-line from any computer with access to the Internet at the site http://www.epa.gov/superfund/sites/cursites/index.htm.

Download Superfund Products

Several CERCLIS reports can be downloaded to a personal computer from the web site http://www.epa.gov/superfund/sites/topics/ftp.htm#dload. These reports contain information on site inspections, preliminary assessments, and the remediation of current and archived hazardous waste sites. CERCLIS Report Descriptions provide a detailed description of each available report. When downloading any of these reports or software, The user can use the "Save File" or "Save to Disk" feature on their Web browser and save the downloaded files in their own folder (directory).
All of the reports are in ASCII format and are self-extracting executable files, meaning the files automatically "expand." The CERCLIS Reports Browser, a DOS based browsing tool, must be downloaded in order to view any of the CERCLIS reports. Within the browser there is a file that allows the reports to be opened automatically. This browser works with all of the reports, therefore it only needs to be downloaded once.

CIESIN

DESCRIPTION OF DATABASE

Center for International Earth Science Information Network (CIESIN) specializes in global and regional network development, science data management, decision support, and training, education and technical consultation services. CIESIN is made up of interactive applications, metadata resources, data resources, services (e.g., GIS, email, and online discussions), information systems and resources (e.g., multiple CONUS & OCONUS databases).

ACCESS TO SYSTEM

The CIESIN database has unrestricted access (upon registration) available through the Internet via the provided Internet address:

www.ciesin.org

POTENTIAL DATABASE USERS

☒ Medical Intelligence   ☐ Military Intelligence   ☐ Forward Echelons

☒ Researchers/Scientists   ☒ Public Health (Base Level)   ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level)   ☐ Medical Command and Control   ☐ MAJCOM/SG

☐ Theater Medical Surveillance Team   ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Potential use for pre-deployment information collection or follow-up investigations. Limited potential for role in DESS.

SECURITY ISSUES RELATED TO THE DATABASE

Users of CIESIN email system must register through the CIESIN website, after which unlimited email capabilities are available through CIESIN. CIESIN has unrestricted user access.

ADVANTAGES	DISADVANTAGE
• Populated database • GIS-linked (portions of database only) • Treaty and foreign law data • •	• Unrestricted user access • Limited geographical representation of data • Mostly U.S. data • Mostly demographic data

ENVIRONMENTAL

SEDAC/CIESIN
Socio-Economic Data Application Center/
Center for International Earth Science Information Network

Database Selections

CIESIN Catalogs
- SEDAC Catalog
- World Data Centers (WDC) for Human Interactions in the Environment Collection
- CIESIN Government Information Locator System (GILS) Catalog
- CIESIN/USDA Catalog
- Global Change Research Information Office (GCRIO) Bibliographic Database
- US Global Change Research Program (USGCRP) FY95 and FY96 Program Summaries
- GCRIO Online Documents
- Consequences
- Aspen Global Change Institute (AGCI) EarthPulse Notes
- AGCI Elements of Change

Selected International Catalogs
- Earth Science and Technology Organization (ESTO) (Japan) Asian/Pacific Catalog
- United Nations Environment Programme (UNEP) Global and Regional Integrated Data (GRID)
- Inter-American Geospatial Data Network
- Biological Resource Maps-Costa Rica (KU)
- Southern Africa Metadata
- Caribbean Environment Programme
- CODEPLAN - Brasilia Brazil
- Africa Data Dissemination Service

Selected U.S. Federal Catalogs
- Global Change Master Directory
- National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center
- National Snow and Ice Data Center
- NCDC Library of Historical Datasets
- NOAA National Marine Fisheries Service
- NOAA Central Library Historical Datasets
- NOAA Environmental Services Data Directory
- National Biological Information Infrastructure Metadata Clearinghouse
- USGS Water Information
- US Army Corps of Engineers
- FEMA Flood Insurance Rate Maps- Q3 Flood Data Sampler
- Natural Resources Conservation Service Digital Soils Data
- Bureau of Transportation Statistics (BTS) National Transportation Atlas Database

Selected U.S. State/Local Catalogs
- Illinois Natural Resources Geospatial Data Clearinghouse Node
- Georgia GIS Data Clearinghouse
- The University of Montana
- Montana State Library
- Nebraska Geospatial Data Clearinghouse
- Alaska Geospatial Data Clearinghouse
- Wisconsin Land Information Clearinghouse
- North Carolina Corporate Geographic Database
- Mount Desert Island Region - Maine

- Delaware Geospatial Clearinghouse Node
- State of Kansas Data Access and Support Center
- Wyoming Natural Resources Data Clearinghouse
- Pennsylvania Digital Raster Graphics
- Pennsylvania Spatial Data Access Node
- State of Pennsylvania Elevation Data
- MIT/MassGIS Digital Orthophoto Project
- Washington State Geospatial Clearinghouse Node
- West Virginia State GIS Technical Center
- New Mexico Resource Geographic Information System
- Geological Survey of Alabama Geospatial Data Clearinghouse Node
- Montana Dept. of Environmental Quality
- New York State GIS Metadata Repository
- Texas Natural Resources Information System
- Helena National Forest
- Greater Yellowstone Area Data Clearinghouse
- San Francisco Bay/Delta GIS
- North Texas GIS Consortium

Other Information Resources
- Library of Congress
- Medline

Center for International Earth Science Information Network
Columbia University

INFORMATION FOR A CHANGING WORLD

CIESIN was established in 1989 as a non-profit, non-governmental organization to provide information that would help scientists, decision-makers, and the public better understand their changing world. CIESIN specializes in global and regional network development, science data management, decision support, and training, education and technical consultation services. CIESIN is the World Data Center A (WDC-A) for Human Interactions in the Environment.

Interactive Applications

DDCarto- **Demographic Data Cartogram Service**

Interactive order of 1990 census data in prominent GIS data formats.

DDViewer- **Demographic Data Viewer**

Interactive mapping of 1990 U.S. census data.

ENTRI- **Environmental Treaties and Resource Indicators Service**

A searchable relational database containing international environmental treaties, treaty summaries, treaty status files and natural resource indicators.

Geocorr- **Geographic Correspondence Engine**

Create correlation lists between various U.S. geographies.

Great Lakes Map Server

Interactively compose a map with selected EPA site datasets and feature coverages for any U.S. region within the Great Lakes.

MVA- Model Visualization and Analysis for Integrated Assessment Models of Climate Change

Access to guide information on Integrated Assessment Modeling, selected IAMs, and scenario outputs from selected IAMs.

Ulysses (tm) Cross-tabulation Engine

Interactive access to decennial U.S. census micro-data.

UVIS- UV Interactive Service

An interactive, custom-query service that allows for on-screen visualization of hourly, daily, and monthly UV dose variables from selected locations across the United States.

SRES- Open Process Site for the IPCC Special Report on Emissions Scenarios

Access and provide feedback on scenarios of future greenhouse gas emissions prepared by Working Group III of the Intergovernmental Panel on Climate Change.

Metadata Resources

CIESIN's Guide to Metadata

Information and resources about metadata.

CIESIN Gateway

Locate environmental and socioeconomic data using this distributed international catalog of metadata resources.

GLREIS Metadata Search

Search the Great Lakes Regional Environmental Information System Metadata Directory.

CIESIN Dataset Guides

Data Resources

Archive of Census Related Products

Post-processed extracts from the 1990 STF3A and 1992 TIGER data linked by polygon ID number; U.S. population, housing density and land cover classification data on a 1km2 grid.

China Dimensions Data Collection

Guides for and access to a rich collection of data resources on the People's Republic of China. Highlights include digital administrative boundaries; fundamental GIS layers; county-level data on population, agriculture, economics and hospitals; and interactive access to the 1982 census of population.

Environmental Treaty Texts

Full text of more than 140 international environmental agreements.

Gridded Population of the World

Dataset description and access to world and continental population counts and density on a 5 minute grid.

Global Population Database

Population data on a 20 minute by 30 minute grid for more than 100 nations; includes urban density circles.

Georeferenced Population Data Sets of Mexico

Dataset description and access to various population GIS coverages of Mexico.

Monitoring Environmental Progress

Interactive query of the World Bank's database of indicators of environmentally sustainable development.

Public Use Microdata Samples (PUMS)

Microdata from the decennial U.S. censuses of 1970-1990.

Social Indicators of Development

Interactive query of the World Bank's dataset containing 125 socioeconomic variables from more than 170 economies for the period 1965-1993.

World Resources 1996-97

Interactive query of the authoritative Guide to the Global Environment from World Resources Institute.

Information Systems and Resources

Annotated Guide to Earth Remote Sensing Data and Information Resources for Social Science Applications

Online version of Appendix A in People and Pixels: Linking Remote Sensing and Social Science (Committee on the Human Dimensions of Global Change. D. Liverman, E. Moran, R. Rindfuss, and P. Stern, eds., National Academy Press, 1998).

Access to U.S. Demographic Data

A collection of applications and data resources for analysis of U.S. demographics.

Resources for ATSDR Public Health Assessments

Provides access to information, data and metadata pertinent to public health assessments for selected federal facilities. Includes tools for creating and managing metadata.

Great Lakes Regional Environmental Information System (GLREIS)

GLREIS provides access to a wide array of data, information and unique tools relevant to the Great Lakes region.

Land and Water Knowledge Management Node

LW-KMN is a specialized electronic information library to promote more efficient and sustainable management of land and water resources in developing countries and the world.

U.S. - Mexico Border Regional Environmental Information System (US-MBREIS)

US-MBREIS provides access to data, information and unique tools relevant to the United States / Mexico Border region.

Stratospheric Ozone and Human Health Project

A suite of information products in the areas of ultraviolet (UV) radiation, ozone, and human health impacts of UV exposure.

Thematic Guides to key environmental issues, including:

agriculture

human health

land use

ozone depletion

political institutions

remote sensing

environmental treaties and resource indicators (designed to support the ENTRI service)

integrated assessment modeling of climate change (designed to support the MVA service)

AIDS Data Animation Project

Weekly age-, sex-, and race-adjusted data on mortality due to Acquired Immune Deficiency Syndrome (AIDS) for each U.S. county for the years 1981 to 1993.

Services

AR/GIS

Active Response GIS is a land use planning tool that combines GIS and group process management capabilities using a network of laptop computers

WWW.Mail

CIESIN provides e-mail access to the World Wide Web. Initiate registration by sending a "help" message to www.mail@ciesin.org.

Mailing Lists

AGIS-L

List for discussion of AtlasGIS® and related desktop mapping issues.

HDGEC

List for discussion of Human Dimensions of Global Environmental Change issues.

INT-LAW

Online discussion and sharing of information about/on foreign, comparative and international (fci) legal resources.

SDE

List for discussion of the Spatial Data Engine® and related spatial data management issues.

TFOE

Programs

Environmental Protection Agency Cooperative Agreement

GCRIO - Global Change Research Information Office

SEDAC - Socioeconomic Data and Applications Center

USDA/CIESIN Global Environmental Change Data Assessment and Integration Project

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ENSIS

DESCRIPTION OF DATABASE

Environmental Surveillance and Information System (ENSIS) can be used to assess the state of the environment, give an overview of the pollution sources, and hence be a tool for cost-effective pollution abatement strategies. ENSIS consists of 3 parts: ENSIS Basic, ENSIS WaterQuis, and ENSIS AirQuis. These parts share one database and they are integrated under the same graphical user interface.

ACCESS TO SYSTEM

The ENSIS database has unrestricted access available through the Internet via the provided Internet address:

www.niva.no/ensis

POTENTIAL DATABASE USERS

☒ Medical Intelligence ☐ Military Intelligence ☒ Forward Echelons

☒ Researchers/Scientists ☐ Public Health (Base Level) ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level) ☒ Medical Command and Control ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Use by rear echelon consultants to predict contaminant behavior.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access; problems if DESS data must be updated to ENSIS Oracle database.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ GIS-linked ▪ Oracle-based system; Windows NT interface ▪ Exposure modeling for air/water based on point source releases ▪ Statistical analysis package ▪ Standard report generation ▪ Internet interface ▪ Thin-client technology	▪ Unrestricted user access ▪ Limited geographical representation of data (e.g., Norway and China) ▪ Unknown data quality ▪

ENVIRONMENTAL

ENSIS
An Environmental Surveillance and Information System

What is ENSIS?

ENSIS consists of ENSIS WaterQuis, ENSIS Airquis, and a basic module. ENSIS WaterQUIS is a management and decision support system for the environmental protection of water resources. WaterQUIS provides a geographic information system interface (GIS) for the integration and display of water quality monitoring and modelling results. The system can be used as a management tool for planners, an information tool for the public and an expert system for specialists.

ENSIS AirQuis is a similar tool, and can provide information on the air quality in an area and the pollution levels to which the population is exposed.

ENSIS is developed as a joint co-operation between the Norwegian Institute for Water Research (NIVA), the Norwegian Institute for Air Research (NILU) and the IT-company Norgit.

Basic features of ENSIS

ENSIS can be used to assess the state of the environment, give an overview of the pollution sources, and hence be a tool for cost-effective pollution abatement strategies. Basic features of ENSIS WaterQuis are:

- Map based user interface (GIS)
- Storage, retrieval and presentation of water quality and quantity data
- Automatic and manual collection and quality control of monitoring data
- Statistical processing of data, and graphics for presentation
- Water quality classification system and map presentation of classified water quality
- Domestic, industrial and agricultural pollution sources inventory
- Models showing pollution levels to which the public and the environment are exposed
- Inventory of water resources, including catchments, rivers, lakes and coastal areas
- Document handling system
- Report generator
- Utilises an Oracle database for central storage of data, and runs on Windows NT

Installations and Applications

ENSIS is installed several places in Norway, three provinces in China, and is applied in research projects at NIVA and NILU. Examples of installations and applications are:

- The inter-municipal co-operation ANØ (Avløpsambandet Nordre Øyeren), Norway
- Fredrikstad Municipality, Norway
- Sarpsborg Municipality, Norway
- Oslo Municipality, Norway
- Drammen Municipality, Norway
- Song Hua River System, Heilongjiang province, China
- Yantai, Shandung province, China
- Reporting to EEA (European Environmental Agency)
- EMERGE, on-going EU-project dealing with remote mountain lake ecosystems

ENSIS – Examples of Installations

ENSIS is installed several places in Norway, three provinces in China, and is applied in research projects at NIVA and NILU. A few examples are briefly described in this fact sheet.

Song Hua River System, Heilongjiang, China

There is a strong need for monitoring of the most important water course in the Heilongjiang Province in the northern part of China, the Song Hua Jiang. The Song Hua Jiang supplies drinking water to more than 25 million people. Its

water is also used as water supply for industrial plants, as source for irrigation of agricultural fields, for transport purposes, fishing and recreation. The river is still heavily polluted despite the efforts made by the authorities in the Heilongjiang and Jilin provinces over the last decade to reduce the load of polluted discharges. The Song Hua Jiang represents the boundary between Russia and China in this area. At present, ENSIS is being applied for monitoring the water quality, registration of pollution sources and abatement studies, all carried out by local experts.

Yantai, Shandung, China
ENSIS is also being used in the Shandong province in China, and the project encompasses monitoring of air and water in the city of Yantai. Yantai is a city of about 500 000 inhabitants, which is a normal size city in China. Chinese authorities therefore selected Yantai as a 'pilot project city'. At a later stage, the system to be applied for Yantai may become the model for monitoring of the environment in similar cities in China.

The water monitoring is concentrated on the river Jia and the water reservoir Menlou. In addition to the current manual water sampling being carried out by provincial and city authorities, instruments for continuous monitoring of the water quality at three monitoring stations in the watercourse is installed. The monitoring stations are in the vicinity of the inlets for the water supply stations and will ensure a better and safer monitoring of the raw water of the water supply stations.

The lower part of Glomma, Norway
During 1997, the project on establishing ENSIS in the Sarpsborg/Fredrikstad area was launched. The first instance developed an overview of the existing monitoring data and environmental information. Water samples are being taken on a regular basis in the region in various contexts and for various employers. ENSIS enables the counties to get a better overview and a better use of both the water quality data and the data regarding discharge points.

The inter-municipal co-operation ANØ (Avløpsambandet Nordre Øyeren), Norway
ANØ is an inter-municipal consultant company owned by 10 municipalities in the Southern part of Norway. The company has installed and operates ENSIS to provide the municipalities with accurate and detailed information about the status of the environment and pollution. It has been important for ANØ to present data in an easy accessible and user-friendly manner, both for the managers in the municipalities and for the general public.

Applied in the EMERGE project
EMERGE is a EU-project with 26 European partners. Large amounts of data will be produced within the project. The data will have a large variation in structure. Physical, chemical, biological, and socio-economical data will be collected. ENSIS provides tools to search for data, compare different data types (eg. fish data and water quality), analyse the data and present them in a user-friendly manner. Partners in London, Prague and Barcelona will be connect to ENSIS with use of thin client technology. All data are stored in the ENSIS database, and the built-in tools can then be utilised by the partners.

ENSIS Basic and WaterQUIS at a Glance

ENSIS is a management and decision support system for environmental issues. ENSIS includes ENSIS Basic, ENSIS WaterQuis and ENSIS AirQUIS. These parts share one database, and they are integrated under the same graphical user interface. This fact sheet points out the functionality of the modules ENSIS Basic and ENSIS WaterQUIS.

ENSIS has jointly been developed by the Norwegian Institute for Water Research (NIVA), the Norwegian Institute form Air Research (NILU) and the IT-partner Norgit. ENSIS 2.1 is available as a commercial product.

Geographical Information System (GIS)
The geographical information system (GIS) is a major part of ENSIS. All geographical defined elements such as monitoring stations, wastewater treatment plants, industries, rivers, lakes, coastal areas can be created, selected, inspected and edited through the GIS interface. The elements displayed through GIS are all directly connected to standard registration dialogues where data are entered and edited. The registration forms can also be reached via the pull-down menu system.

The ENSIS database
The ENSIS database is prepared to receive and store a wide range of environmental information, such as monitoring data to asses the status of the environment, data about the pollution sources that causes pressure to human beings and

the environment, and information related to the water resources. Search for data can be done through the GIS interface or by using alphanumerical criteria available from standard graphical forms. Search criteria are tailor-made for the type of data in question, and can for instance be geographical location, measured component, time period for the measurements, or type of
industry.

ENSIS on the Web
A web-interface to the ENSIS database has been developed. This gives the general public access to information about environmental quality via the World Wide Web. It will enhance public awareness of environmental issues, and increase the participation in the decision-making process.

Thin client technology
ENSIS can also be used as a central database solution with use of "thin client" technology. This allows sharing of data, and all the built-in tools in ENSIS, over long distances, even though the network capabilities might be limited.

Features of ENSIS Basic and ENSIS WaterQuis

Features of ENSIS Basic
Geographical information system (GIS)
Description and registration of monitoring data
Storage of physical and chemical data
Manual data acquisition system
Automatically data acquisition system
Import and export from/to external data sources
Search of data by geographical and numerical criteria
Graphical presentation of data
Numerical presentation of data
Statistical processing of data
Tools for quality control of data
Report generator
System for document handling and storage of images
ENSIS accessible with use of Thin client technology
Access to the ENSIS database via World Wide Web

Features of WaterQUIS
Definition and registration of information and data about catchments, rivers and lakes
Definition and registration of coastal information
Registration of discharge from domestic waste water
Registration of discharge from industry
Registration of pollution from diffuse sources
Environmental classification system for water quality
Model for calculation of pollution load

Technical Highlights
The ENSIS software is running on Windows NT platform, and is developed for an Oracle database. The GIS is programmed with MapObjects from ESRI, which makes it compatible with ArcView and ArcInfo.

Further Information
For additional information feel free to contact:
Norwegian Institute for Water Research (NIVA)
P.O. Box 173 Kjelsås
0411 Oslo
Norway
Telephone: + 47 22 18 51 00
Fax: + 47 22 18 52 00
E-mail: kjersti.dagestad@niva.no
Www: http://www.niva.no/ensis/

September, 2000

HazDat

DESCRIPTION OF DATABASE

Agency for Toxic Substances and Disease Registry's (ATSDR) database which provides information on the release of hazardous substances from Superfund sites/emergency events and on the effects of hazardous substances on the health of human populations. Information is applicable only to Continental United States (CONUS), Hawaii, Alaska, and U.S. territories.

ACCESS TO SYSTEM

The Hazardous Substance Release/Health Effects (HazDat) database has unrestricted access available through the Internet via the provided Internet address:

www.atsdr.cdc.gov/hazdat.html

POTENTIAL DATABASE USERS

☒ Medical Intelligence   ☐ Military Intelligence   ☐ Forward Echelons

☒ Researchers/Scientists   ☒ Public Health (Base Level)   ☒ AFIERA

☒ Bioenvironmental Engineering (Base-level)   ☐ Medical Command and Control   ☐ MAJCOM/SG

     ☐ Theater Medical Surveillance Team   ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES	DISADVANTAGES
• Populated Database (CERCLIS data)	• Unrestricted user access
	• CONUS plus OCONUS U.S. territories
	• Information from CERCLA sites only

ENVIRONMENTAL

HazDat Database

ATSDR's Hazardous Substance Release and Health Effects Database

Database Abstract/Summary

HazDat, the Agency for Toxic Substances and Disease Registry's Hazardous Substance Release/Health Effects Database, is the scientific and administrative database developed to provide access to information on the release of hazardous substances from Superfund sites or from emergency events and on the effects of hazardous substances on the health of human populations. The following information is included in HazDat: site characteristics, activities and site events, contaminants found, contaminant media and maximum concentration levels, impact on population, community health concerns, ATSDR public health threat categorization, ATSDR recommendations, environmental fate of hazardous substances, exposure routes, and physical hazards at the site/event. In addition, HazDat contains substance-specific information such as the ATSDR Priority List of Hazardous Substances, health effects by route and duration of exposure, metabolites, interactions of substances, susceptible populations, and biomarkers of exposure and effects. HazDat also contains data from the U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, including site CERCLIS number, site description, latitude/longitude, operable units, and additional site information.

Database Access

Internet HazDat may be queried directly from a World-Wide Web Browser with Forms support by clicking on any one of the database queries listed below. This method of access to our relational database was made possible by GSQL, a simple forms interface to SQL databases, developed at the National Center for Supercomputing Applications (NCSA). More information on GSQL may be found in NCSA's Tutorial on GSQL.

Query and Search the HazDat Database

Database Last Updated - Sat Nov 11 07:05:31 EST 2000
- Site Activity Query
- Site Activity - Sensitive State Map
- Site Contaminant Query
- Toxicological Profile Query
- ToxFAQ Sheets Text Search
- Public Health Assessments Text Search

Database Fields

Internet HazDat data fields (or columns) are defined in the Internet HazDat Data Dictionary. You can also click on a column header in result tables to access the definition of a specific column.

Data Acquisition/Collection Summary

ATSDR has conducted public health assessments at more than 1,450 sites, developed toxicological profiles for more than 150 hazardous substances, performed more than 5,000 health consultations, and conducted or funded more than 150 health studies. These activities have resulted in the publication of many Agency documents. Important information from these source documents has been abstracted into the Agency's HazDat database, and new information is added on a continuous basis. The information provided in Internet HazDat will be expanded and updated at regular intervals.

Related Datasets

HazDat contains data from the U.S. Environmental Protection Agency's CERCLIS database including site CERCLIS number, site description, latitude/longitude, operable units, and additional site information. This information allows the cross-referencing of hazardous waste sites with EPA databases.

Additional environmental, socioeconomic, earth science, and global change datasets may be located through CIESIN's SEDAC Data and Information Catalog Services.
For datasets specifically relevant to Federal Facilities Public Health Assessments see the CIESIN Information Network ATSDR Node.

Internet HazDat - Data Dictionary

Included in Internet HazDat are the following fields or columns:

- abs_doc_title
- address
- cas_id
- CERCLA_regulated
- cerclis_no
- city
- conc_unit_txt
- conc_year
- cong_dist
- contam_name
- contaminant
- county_txt
- fac_text
- fed_fac
- FIFRA_regulated
- final_date
- latitude
- longitude

- max_conc
- media_txt
- npl_text
- NTIS_number
- owner_text
- population
- proj_text
- proj_type
- public_health_threat_category
- RCRA_regulated
- region_no
- s_loc_txt
- site_count
- site_id
- site_name
- stat_final_d
- stat_pub_d

- state
- status_date
- status_text
- substance_class_txt
- substance_name
- substance_rank
- to_chems
- to_docs
- to_sites
- to_text
- to_toxfaq
- tox_profile_name
- tox_profile_no
- TSCA_regulated
- type_text
- zip_code

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INFOTERRA

DESCRIPTION OF DATABASE

INFOTERRA is a global environmental information exchange, including referral system, of scientific, technical, and bibliographic materials and institutional sources, operating through a network of 174 government designated national focus points. This network of national, regional, and sectoral partners work together provide an international query/response service focusing on scientific/technical information.

ACCESS TO SYSTEM

The INFOTERRA database has unrestricted access available through the Internet via the provided Internet address:

www.unep.org/infoterra

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☒ Researchers/Scientists

☒ Public Health (Base Level)

☒ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Provide baseline and/or planning environmental intelligence on an area prior to deployment. Links to scientific information may be valuable for detailed investigations.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ Covers many areas where deployment is possible ▪ ▪	▪ Unrestricted user access ▪ Limited geographical representation of data ▪ ▪

ENVIRONMENTAL

INFOTERRA

About UNEP-Infoterra

INFOTERRA is the global environmental information exchange network of the United Nations Environment Programme(UNEP). The network operates through a system of government-designated national focal points which at present number 177. An INFOTERRA national focal point is essentially a national environmental information centre usually located in the ministry or agency responsible for environmental protection. The primary function of each centre is to provide a national environmental information service.

INFOTERRA received its mandate at the 1972 Stockholm Conference on the Human Environment which recommended the establishment of a mechanism for the exchange of environmental information and experiences among countries. In response to this recommendation, UNEP established the INFOTERRA network (initially known as IRS - International Referral System) and governments were requested to designate a national focal point to coordinate INFOTERRA activities at the country level. The 1992 Rio Conference on Environment and Development (UNCED) reiterated the importance of information for decision-making and requested the strengthening of the INFOTERRA network to improve information availability (Agenda 21, Chapter 40).

At the national level, **INFOTERRA focal points** provide a wide range of environmental information products and services including environmental bibliographies; directories of sources of information; query-response services; environmental awareness leaflets; and access to Internet services.

The INFOTERRA secretariat at UNEP headquarters, Nairobi, supports the national focal points by providing technical services and publishing reference tools such as the EnVoc Multilingual Thesaurus of Environmental Terms;the International Directory of Sources; training manuals; sourcebooks; and promotional materials. A capacity building programme provides assistance to focal points in developing countries.

Anyone looking for information on the environment is welcome to contact the INFOTERRA network through one or more of the following channels:

1.UNEP World Wide Web (WWW) site (http://www.unep.org)
2.INFOTERRA list server (instructions on list of addresses for all 176 national focal points is available from the INFOTERRA secretariat or may be downloaded from our Website); and
3.INFOTERRA Secretariat (address given below).

INFOTERRA will respond with substantive information from local or international sources of environmental information

INFOTERRA Secretariat
Division of Environmental Information, Assessment and Early Warning
United Nations Environment Programme
P.O. Box 30552, Nairobi, KENYA
Tel: (254 2) 624299
Fax: (254 2) 624269
E-mail: infotinf@unep.org

The ENRIN programme is administered by UNEP's Environmental Information Networking Unit, in the Division of Environmental Information and Assessment (DEIA). Environmental information networking is a key element in facilitating the collection, exchange and dissemination of environmental data and information between countries and regions for the collaborative assessment of key environmental issues related to sustainable development in order to improve international policy formulation and planning, and to raise public awareness.

Mission statement

To promote development of national and sub-regional capacities in environmental data and information management to support State-of-the-Environment (SoE) and issue-based assessments by partner institutions in developing countries and countries with economies in transition.

Focus

UNEP's ENRIN Programme evolved to address the following AGENDA 21 issues (Chapter 40):

The accessibility of relevant and appropriate environment and natural resources information to decision making processes at national and regional levels;

The capacity of existing national and regional institutions to manage environment and natural resources information and improve delivery to decision making processes.

The ENRIN programme focuses on developing countries in Africa, Asia and the Pacific, Latin America and the Caribbean, as well as in countries with economies in transition in Eastern Europe, and is implemented by outposted Regional Coordinators.

Objectives

To establish or enhance operational environment and natural resources information systems and networks which fully support the information requirements of strategic planning frameworks, assessment and reporting. This is done through cooperation with existing governmental and intergovernmental programmes:

at the National level for environmental management action plans and natural resource use;

at the Sub-regional level to provide information to support action plans initiated to deal with issues related to shared resources (e.g. Regional Seas and River Basin Action Plans);

at the Regional level to facilitate regional assessments, within a global framework, of major environmental issues and environmental reporting, the analysis of data to detect emerging issues, and to mobilize responses to environmental change.

Strategy and Approach

ENRIN is a coordinated suite of activities designed to provide technical assistance and help formulate capacity building projects related to environmental assessment. The aim is to enhance the institutional capacities of national agencies and appropriate sub-regional intergovernmental organizations to carry out environmental assessment and reporting tasks, and to create, improve or manage databases as appropriate. The ENRIN approach to capacity-building has four steps, each carried out with national or regional partner institutions:

National or regional consultations to evaluate requirements and develop strategies to address priority environment assessment, reporting, and/or associated data management issues; Formulation of investment projects to enhance or develop the necessary institutional skills, technology and staff capacities together with representatives from participating institutions; Joint efforts to secure funding for implementation, when possible with seed funding from UNEP's Environment Fund used to leverage funds from multi and bilateral donors; Finally, provision of long-term technical backstopping assistance by UNEP's GRID and INFOTERRA networks.

Results

Africa - Capacity building projects to develop or enhance environmental information systems and networks are being implemented in six countries (Eritrea, Ghana, Kenya, Tanzania, Uganda and Zambia) and in four sub-regions (CILSS, ECOWAS, IGAD, SADC), with more planned at the national (Madagascar and Botswana) and sub-regional levels (IOC). In addition, Geographic Information Systems (GIS) units have been established in Burkina Faso, Ivory Coast, Lesotho, Mozambique, and Niger.

Asia and the Pacific - Operational agreements and programmes are being implemented with five sub-regional intergovernmental organisations (ASEAN, ICIMOD, MRC, SACEP, SPREP) covering 40 countries. Capacity building activities are at varying stages in 30 countries in the Region involving technology transfer through training/ workshops and provision of hardware and software. Assistance has been provided in the preparation of national and sub-regional SoE reports for the ASEAN region, the Greater Mekong sub-region, South Asia and the South Pacific.

Central and Eastern Europe - Assessments of environmental information systems have been completed and reports published for twelve countries in the region, with three more in the pipeline. Through cooperating partners seven countries have produced prototype SoE reports available on the Internet (Poland, Hungary, Estonia, Latvia, Lithuania, Ukraine and Georgia). At the sub-regional level assistance is being provided to the

Black Sea Environmental Programme (BSEPCU) and the Environmental Programme of the Danube River Basin.

Latin America and the Caribbean - Networks strengthened through agreements with national governments, national, sub-regional and regional organizations and institutions. In cooperation with UNDPCSD a local (regional) sustainability indicators programme has been developed which addresses environmental concerns.

Partner Institutions

The ENRIN programme operates through cooperative partnerships which include:

national governments (both as clients and as donors sponsoring ENRIN activities), sub-regional and regional organisations (SADC, ASEAN, ICIMOD, CCAD, Helcom, etc.), UN organisations (World Bank, UNDP, UNITAR, IAEA, WHO, the Economic Commissions), multilateral organizations (Asian Development Bank, European Union, GEF, OECD, CGIAR), NGOs (IUCN, WCMC, CIESIN), academic institutions (Moscow State University, University of Botswana, Asian Institute of Technology), and the private sector (ESRI, Le Monde Diplomatique).

For more information please contact:

Mr. Dan Claasen
Chief, Environmental Information Networking Unit
Division of Environmental Information and Assessment
UNEP, PO Box 30552, Nairobi, Kenya
Tel: (254 -2) 624225
Fax: (254-2) 623943 or 623944
E-mail: claasend@unep.org or eiainfo@unep.org
WWW: http://www.unep.org/unep/eia/ein/
Requests for further information may be forwarded to Environment and Natural Resources Information Networking.
Last Updated: 29 April 1999 Maintained by: eisinfo@unep.org

MERCURE

DESCRIPTION OF DATABASE

MERCURE offers a new and highly efficient technological platform to keep pace with the rising global demand for environmental information. By coupling the power of modern telecommunications with state-of-the-art information management techniques United Nation Environmental Programme (UNEP), through MERCURE, hopes to bridge the environmental "data gap" and improve information availability.

ACCESS TO SYSTEM

MERCURE has unrestricted access available through the Internet via the provided Internet address:

www.unep.org/unep/eia/eis/mercure

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☐ Researchers/Scientists

☐ Public Health (Base Level)

☐ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilitie

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

\MERCURE uses a militarily unsecure telecommunications system (e.g., Intelset system), located at 16 earth stations across the globe. MERCURE has unrestricted user access.

ADVANTAGES

* None
*
*
*
*

DISADVANTAGE

* Unrestricted user access
* Militarily unsecure telecommunications system
* Military systems are adequate
*

ENVIRONMENTAL

MERCURE

About the *Mercure* Telecommunications System

The issues *Mercure* addresses

Implementation of Mercure - a suite of 16 earth stations providing global telecommunications via Intelset system -- is underway supported by a significant in-kind donation to UNEP by European Space Agency member states: Austria, Belgium,Norway, Spain, Switzerland, and U.K.

It is designed to improve the dissemination of environmental information, especially to developing countries and countries with economies in transition. By use of off-the-shelf technology and non-proprietory standards UNEP is ensuring that these partners can reach information sources world-wide, not just those of UNEP.

Mercure is to enable UNEP to enhance both internal communication and its users' and constituents' access to UNEP based and facilitated access to environmental information. It is unique in its dedication to environmental information and its ability to extend the "Environmental Information Superhighways" into developing countries which otherwise would have limited such information.

Mercure is also to contribute significantly speedier and more cost-effective communication among UNEP Offices around the world.

How *Mercure* Operates

An initial array of sixteen ground-stations around the world, communicating through 'Intelsat' satellites located high over the Indian and Atlantic Oceans, will allow UNEP Regional Offices, nati onal environment agencies and scientific partners to exchange documents, environmental data, images and messages economically, rapidly, reliably and readily. (A diagrammatic overview of the Mercure concept is available.)

The "hub" station in Leuk, Switzerland is completed. The stations in Nairobi have been installed and initial services between Leuk and Nairobi should in operation by the end of May. The *Mercure* earth stations will be located at the following sites:

Subnet A	Subnet B
Leuk	Alma Ata
San Jose	La Paz
Nairobi	Hanoi
Moscow	Manama
Bangkok	Havana
Beijing	Maputo
	Kathmandu
	Niamey

Site preparations are being prepared for Subnet A stations and equipment is being readied for shipment. Subnet B stations will be completed by the end of October 1996.

In addition to the basic telecommunications system being implemented through *Mercure*, the Internet functionality is being included throughout the system. This approach, in combination with other existing Internet partnerships, will initiate the UNEP Internet, to be called UNEPnet . Activity is also under way to utilize this configuration for UNEP's unified approach to the information system architecture design that will ease exchange of environment information products between UNEP and its partners.

Full compliance with Internet standards ensures that these items can in turn to be exchanged widely with other parties. Each *Mercure* site with access to the global net will operate as a secure gateway (as seen in the accompanying diagram) to environmental information products accessible from around the world via the global Internet.

Access by UNEPs own programmes' to the sources of these data and information, and their ability to exchange and collate them between UNEPs widespread centres and partners, will similarly be improved and should result in enhanced

quality of the products available to constituents. Thus, Mercure will be one of the primary element of the corporate UNEP-wide communication network: UNEPnet .

Characteristics

- Uses non-pre-emptable Intelsat space segments over the Indian and Atlantic Oceans
- North-south axis Geneva-Nairobi
- 8 'A'-class stations (384 kb/s)
- 8 'B'-class stations (64 kb/s) easy to install and allow for re-deployment to meet changing operational dispositions.
- 'B' stations link via 'A'-stations in their hemisphere
- Network control in Leuk, Switzerland
- Combination of permanent (PAMA) and dynamic-assigned (DAMA) links
- Resource allocation and capacity management by UNEP

Capabilities

PAMA

Permanent-Assigned Multiple Access channels: continuously-available connections capable of supporting all Internet protocols and services i.e. WWW (HTTP), Gopher, Telnet and FTP.

DAMA

Demand-Assigned Multiple Access channels: connections are established on demand and released as soon as free. Suitable for support of scheduled and ad hoc batch-oriented tasks such as e-mail on file transfers, as well as for ad hoc interactive sessions using telnet or WWW.

Sub-network A

encompasses high capacity stations providing multiple channels in increments of 64 kb/s on both DAMA and PAMA channels.

Sub-network B

The smaller Subnet-B ground stations operate fewer multiple channels in increments of 16 kb/s in DAMA

Schedule

Mercure satellite ground station and space segments are planned to be completed by the end of 1996. The main milestones are:

- Agreement signed between UNEP and ESA member states (Nov 94)
- Preliminary Design review (Apr 95)
- Critical Design Review Aug 95
- Quality tests Aug 95-Nov 95
- Selection of A and B sites (Apr 95)-Aug 95
- INTELSAT testing Oct 95-Feb 96
- Transport and install of A stations and Geneva and Nairobi traffic hubs Nov 95-Aug 96
- Atlantic ocean satellite operational Apr 96
- Transport and install B stations Aug 96-Dec 96
- Indian Ocean satellite operational Aug 96

Mercure Products and Services

- IP routing via PAMA links supports interactive Internet applications (gopher, World-Wide Web, network voice and video)
- Store-and-forward operations via DAMA links support SMTP electronic mail transfer, 'rcopy'-type file transfer
- Dynamic balancing of space segment utilization to optimize service levels at all stages
- Video Conferencing

Where *Mercure* Operates

The initial configuration donated to UNEP provides 16 earth stations, to be located as per the list below. UNEP is to extend the system to UN headquarters, New York, to facilitate integration with other UN communications facilities. Moreover, the Mercure system incorporates the flexibility to in future service users in hundreds of countries. Already, the Ministry of Environment, Norway, have committed funds to installation of another Subnet-A station on the site of the Global Resource Information Database facility at Arendal (GRID-Arendal), and the Ministry of Environment, Austria, are also to participate with a Subnet-B site in Vienna.

A complete list of sites is also available. The accompanying map portrays the extent of the Mercure network, and its extensions to other UNEP offices (ROLAC , IEC) by terrestrial connections.

Requests for further information may be forwarded to the Chief, EIS.

ARIP

DESCRIPTION OF DATABASE

The Accidental Release Information Program (ARIP) database collects information on accidental releases of hazardous chemicals at fixed facilities through the use of a questionnaire. The questionnaire is presented to the facility to complete after the release and that data is inputted into the ARIP database.

ACCESS TO SYSTEM

The ARIP database has unrestricted access available through the Internet via the provided Internet address:

www.epa.gov/ceppo/ds-epds.htm#arip

POTENTIAL DATABASE USERS

☒ Medical Intelligence

☒ Researchers/Scientists

☐ Bioenvironmental Engineering (Base-level)

☐ Military Intelligence

☐ Public Health (Base Level)

☒ Medical Command and Control

☒ Theater Medical Surveillance Team

☒ Forward Echelons

☒ AFIERA

☐ MAJCOM/SG

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Database with similar functions may be relevant to document known releases in forward locations for planning and historical exposure evaluations. Should be maintained by DoD separately from ARIP data.

SECURITY ISSUES RELATED TO THE DATABASE

This database is a downloadable file located at the above indicated website. No restrictions are placed on access to the downloadable database file.

ADVANTAGES

- Populated database
- MS Access® compatible
-
-
-

DISADVANTAGES

- U.S. only data
-
-
-
-

ENVIRONMENTAL

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ERNS

DESCRIPTION OF DATABASE

The Emergency Response Notification System (ERNS) database contains information on notifications of oil and hazardous substance releases that have occurred throughout the United States. ERNS now operates under the National Response Center and no longer under EPA.

ACCESS TO SYSTEM

The ERNS database has unrestricted access available through the Internet via the provided Internet address:

www.nrc.uscg.mil/index.html

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☐ Researchers/Scientists

☐ Public Health (Base Level)

☐ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES

- None

DISADVANTAGES

- U.S. only data

ENVIRONMENTAL

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HLPAD

DESCRIPTION OF DATABASE

Hazardous Liquid Pipeline Accident Database (HLPAD) is a database maintained by the U.S. Department of Transportation. HLPAD maintains data relevant to spills, releases, fires, or explosions involving surface and subsurface pipeline systems.

ACCESS TO SYSTEM

Access to HLPAD is not available through the Internet. Access to previous reports in *.pdf format are available through www.dot.gov, while assisted searches are possible via the telephone.

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☐ Researchers/Scientists

☐ Public Health (Base Level)

☐ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

None.

ADVANTAGES	DISADVANTAGES
• None	• No data relevant to DESS

ENVIRONMENTAL

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HMIRS

DESCRIPTION OF DATABASE

Hazardous Materials Incident Reporting System (HMIRS) is a database maintained by the U.S. Department of Transportation. HMIRS maintains data relevant to transportation accidents in which spills or releases of hazardous substances occurred.

ACCESS TO SYSTEM

Access to HMIRS is not available through the Internet. Access to previous reports in *.pdf format are available through www.dot.gov, while assisted searches are possible via the telephone.

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☐ Researchers/Scientists

☐ Public Health (Base Level)

☐ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

None.

ADVANTAGES	DISADVANTAGE
▪ None	▪ No data relevant to DESS

ENVIRONMENTAL

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HSEES

DESCRIPTION OF DATABASE

Hazardous Substances Emergency Events Surveillance (HSEES) is an ATSDR database which describes the public health consequences associated with the release of hazardous substances. Currently, the information in the database only consists of data from 14 state health departments; therefore, the data is limited in scope and geographical coverage.

ACCESS TO SYSTEM

The HSEES database operates using Netscape 4.7 in a Java Runtime environment. With these software packages, HSEES has unrestricted access available through the Internet via the provided Internet address:

www.atsdr.cdc.gov/HSEES

POTENTIAL DATABASE USERS

☐ Medical Intelligence ☐ Military Intelligence ☐ Forward Echelons

☒ Researchers/Scientists ☒ Public Health (Base Level) ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level) ☐ Medical Command and Control ☐ MAJCOM/SG

☐ Theater Medical Surveillance Team ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Potential reference for comparing/estimating health outcomes for similar releases of hazardous materials.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access; however, the database system operates only using Netscape 4.7 in a Java Runtime environment.

ADVANTAGES

- Populated database
- Remotely accessible
-
-
-

DISADVANTAGES

- Unrestricted user access
- Limited scope and geographical representation of data (U.S. only)
- Operates with specific software only
- Data quality unknown

ENVIRONMENTAL

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IMIS

DESCRIPTION OF DATABASE

The Integrated Management Information System (IMIS) database was designed as an information resource for in-house use by OSHA staff and management, and by state agencies which carry out federally-approved OSHA programs. Access to this OSHA work product is being afforded via the Internet for the use of members of the public who wish to track OSHA interventions at particular work sites or to perform statistical analyses of OSHA enforcement activities.

ACCESS TO SYSTEM

The IMIS database has unrestricted access available through the Internet via the provided Internet address:

www.osha.gov/cgi-bin/sichq/sic1

POTENTIAL DATABASE USERS

☐ Medical Intelligence

☐ Military Intelligence

☐ Forward Echelons

☐ Researchers/Scientists

☐ Public Health (Base Level)

☐ AFIERA

☐ Bioenvironmental Engineering (Base-level)

☐ Medical Command and Control

☐ MAJCOM/SG

☐ Theater Medical Surveillance Team

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

None foreseeable.

SECURITY ISSUES RELATED TO THE DATABASE

\his database has unrestricted user access

ADVANTAGES	DISADVANTAGES
▪ None	▪ Regulatory data only

ENVIRONMENTAL

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IRIS

DESCRIPTION OF DATABASE

The Incident Reporting Information System (IRIS) database is a database of information on human health effects that may result from exposure to various chemicals in the environment, for use in risk assessments, decision-making, and regulatory activities.

ACCESS TO SYSTEM

The IRIS database has unrestricted access available through the Internet via the provided Internet address:

www.epa.gov/ngispgm3/iris

POTENTIAL DATABASE USERS

☒ Medical Intelligence   ☐ Military Intelligence   ☒ Forward Echelons

☒ Researchers/Scientists   ☐ Public Health (Base Level)   ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level)   ☐ Medical Command and Control   ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team   ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Reference for responders and consultants for releases of known compounds. Potential use by consultants for evaluation of past exposures documented through DESS.

SECURITY ISSUES RELATED TO THE DATABASE

This database has unrestricted user access.

ADVANTAGES	DISADVANTAGES
▪ Populated database ▪ Widely used and accepted ▪ Covers broad range of chemicals that may be encountered OCONUS ▪	▪ Unrestricted user access ▪ U.S. only data ▪ No direct role in exposure identification/ tracking through DESS ▪

ENVIRONMENTAL

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Federal Databases Track Chemical Accidents

Seven major Federal databases track fires, spills, and explosions involving hazardous chemicals. Incompatibility among these systems makes it difficult to form a complete national picture of accidental releases.

Accidental Release Information Program (ARIP)
Environmental Protection Agency
Content: 4,800 verified reports on serious accidents since 1986
Access: (202) 260-8942; assisted search
Notes: Verified subset of ERNS data

Emergency Response Notification System (ERNS)
Environmental Protection Agency
Content: 300,000 initial notification reports since 1986
Access: (202) 260-2342; assisted search
Notes: Also on RTK NET; (202) 234-8494 or http://www.RTK.NET

Hazardous Liquid Pipeline Accident Database (HLPAD)
Department of Transportation
Content: 2,000 pipeline spills, fires, or explosions since 1985
Access: (202) 366-4569; FOIA required*
Notes: Costs apply for data searches

Hazardous Materials Incident Reporting System (HMIRS)
Department of Transportation
Content: 220,000 transportation accidents since 1971
Access: (202) 366-4555; assisted search
Notes: $35 minimum for data search requests

Hazardous Substances Emergency Events Surveillance (HSEES)
Agency for Toxic Substances and Disease Registry
Content: 11,000+ releases with public health consequences since 1990
Phone: (404) 639-6203; no direct public access
Notes: Published reports available

Integrated Management Information System (IMIS)
Occupational Safety and Health Administration
Content: 100+ injurious accidents each year from workplace inspections
Access: (202) 219-7008; two week response time
Notes: Injuries may not involve chemicals

Incident Reporting Information System (IRIS)
National Response Center
Content: 330,000 initial incident reports since 1982
Access: (202) 267-2185; FOIA required*
Notes: Incidents involving releases are also in ERNS
* Freedom of Information Act (FOIA)

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Appendix B
Medical Systems Information

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CHCS/CHCS II

DESCRIPTION OF DATABASE

Composite health care system (CHCS) is a medical and dental information system for each military health system (MHS) beneficiary designed to maintain and manage MHS patient records.

ACCESS TO SYSTEM

Authorized users only from medical and personnel arenas.

POTENTIAL DATABASE USERS

☒ Medical Intelligence

☒ Researchers/Scientists

☐ Bioenvironmental Engineering (Base-level)

☐ Military Intelligence

☒ Public Health (Base Level)

☐ Medical Command and Control

☐ Theater Medical Surveillance Team

☐ Forward Echelons

☒ AFIERA

☒ MAJCOM/SG

☒ Medical Treatment Facilities

DATABASE USE SCENARIOS

Interface with DESS for long term storage of Individual exposure information.

SECURITY ISSUES RELATED TO THE DATABASE

This database has restricted user access.

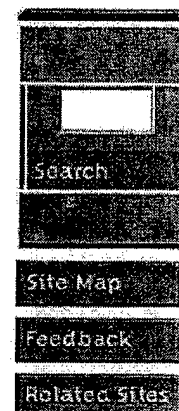| ADVANTAGES	DISADVANTAGES
• Populated Database • Interfaces with DOEhRS-IH • Restricted access • • •	• No environmental information • Unknown compatibility with GEMS and CCS •

MEDICAL

CHCS II
COMPOSITE HEALTH CARE SYSTEM II
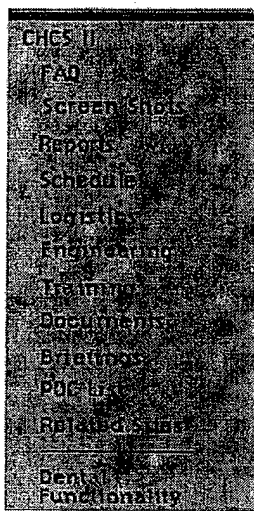
Lt Col Bradley J. Dawkins
(703) 681-7143 x4773
Bradley.Dawkins@ha.osd.mil

CHCS II
FAQ
Screen Shots
Reports
Schedule
Logistics
Engineering
Training
Documents
Briefings
POC List
Related Sites

Demo
Functionality

Search

Site Map

Feedback

Related Sites

CHCS II is a medical and dental clinical information system that will generate and maintain a comprehensive, life-long, computer-based patient record (CPR) for each Military Health System (MHS) beneficiary. Enterprise-wide implementation of this system will support the commitment of the Department of Defense to conduct population health management throughout the MHS.

CHCS II supports Force Health Protection (FHP), Population Health, & MHS Optimization by enabling the MHS to determine the deployment status of units, demand management effectiveness, and disease prevalence, management & outcomes.

Release 1 Capabilities

?? Graphical User Interface (GUI) for clinical and dental outpatient processes
?? Population Health
?? Ambulatory computer- based patient record (CPR)
?? Regional Clinical Data Repository (CDR)
?? Interfaces to Composite Health Care System (CHCS), Defense Enrollment Eligibility Reporting System (DEERS), Third Party Outpatient Collection

CHCS II Overview

Functional Proponent:
Presentation Layer IPT

Functionality:
Release 1

? Graphical User Interface (GUI) for clinical and dental outpatient processes
? Population Health
? Ambulatory computer-based patient record (CPR)
? Regional Clinical Data Repository (CDR)
? Interfaces to Composite Health Care System (CHCS), Defense Enrollment Eligibility Reporting System (DEERS), Third Party Outpatient Collection System (TPOCS)
? Establishes architecture for migration of stove-piped functionality
? Replaces Ambulatory Data System (ADS) and

System (TPOCS)
- ?? Establishes architecture for migration of stove-piped functionality
- ?? Replaces Ambulatory Data System (ADS) and Preventive Health Care Application (PHCA)

Release 2 Capabilities

- ?? Support for General Dentistry
- ?? Globalization (Enables worldwide availability of record)
- ?? Spectacle Request Transmission System (SRTS) Optometric documentation and prescription eyewear orders management
- ?? Interface changes in support of DEERS National Enrollment Database (NED) & Primary Care Manager By Name (PCMBN)
- ?? Read and write to external storage devices and external data sources, data synchronization
- ?? Automated Clinical Practice Guidelines (ACPGs)
- ?? Interface to the Pharmacy Data Transaction Service (PDTS)
- ?? Integrating additional standard medical forms
- ?? Interfaces with the Defense Occupational and Environmental Health Readiness System - Industrial Hygiene (DOEHRS-IH)

Additional information is provided in the **CHCS II Project Management Plan (PMP)**, which is currently under revision. The updated version will be posted. Please check back.

Latest News:

08 - 12 January: The Alpha version of the CHCS II Computer Based Training (CBT) CD-ROM is in the final stage of development. The baseline for the Alpha version will be set at a meeting scheduled for 07 Feb 01. Final review/solicitation of comments will be collected and the professional narration will be inserted. Delivery of the completed copies to Maj James Quigley, CITPO Assistant Director of Logistics, Implementation & Training, is scheduled for 21 Feb 01.

Preventative Health Care Application (PHCA)

Beneficiaries: Patients, TRICARE and MHS administrators, Health Care Providers

 # sites: 104
 # workstations: 32,000

Key Dates/Milestones:

Formal DT&E

?? GPIAT: completed 02 Jun 00
?? GIAT: 22 Jan - 11 Feb

Test Site Activations: completed 16 Oct 00
ORD Approval by JROC: 18 Sep 00
OT&E Data Collection: 09-Apr - 20 May
Target Milestone II/III Decision: 02 Jul
For full details visit the CHCS II / Schedule page.

Accomplishments

? ORD Approval by JROC

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COMMAND CORE SYSTEM

DESCRIPTION OF DATABASE

The Command Core System is a relational database that integrates data across medical, environmental, logistics, and safety areas in support of informed Environmental, Safety, and Occupational Health (ESOH) decision-making.

ACCESS TO SYSTEM

Users can access the Command Core System by FTP; however, the system is secured (level of security is unknown). Each database at base-level is networked together with all other Command Core Systems; therefore, no singular database exists.

POTENTIAL DATABASE USERS

☒Medical Intelligence   ☐Military Intelligence   ☐Forward Echelons

☒Researchers/Scientists   ☒Public Health (Base Level)   ☒AFIERA

☒Bioenvironmental Engineering (Base-level)   ☐Medical Command and Control   ☒MAJCOM/SG

☐Theater Medical Surveillance Team   ☐Medical Treatment Facilities

DATABASE USE SCENARIOS

Bioenvironmental engineering should be able to enter occupational and environmental surveillance data, which would be used to link exposure and outcome data through a modified GEMS.

SECURITY ISSUES RELATED TO THE DATABASE

Unknown; Access is restricted; Privacy Act data; classified data may be an issue

ADVANTAGES

- Populated database
- GIS-linked (currently under development)
- ACC sponsorship
- GEMS interface planned
- AFIERA oversees CSS
- USAF ownership
- Analysis tool(s) can be incorporated

DISADVANTAGES

- Not fully developed/implemented
- Army and Navy not using CCS
-
-
-

MEDICAL

COMMAND CORE SYSTEM

AFIERA COMMAND CORE PROGRAM OFFICE

SUPPORT OF THE KENNEY BATTLELAB INITIATIVE

DEPLOYED ENVIRONMENTAL SURVEILLANCE SYSTEM (DESS)

OPR: Major Craig Dezell, AFIERA/RSEC, DSN 240-6682

BACKGROUND: The Command Core System (CCS) is an Oracle based relational database system that has been deployed to over 70 Air Force installations. This premier system integrates data across the medical, environmental, logistics and safety areas in support of informed Environmental, Safety, and Occupational Health (ESOH) decision-making. The AFIERA Command Core Program Office is responsible for the daily operation and maintenance of CCS, and the execution of CCS projects valued in excess of $2.4 million as directed by the lead command. Air Combat Command (ACC) is the lead MAJCOM for Command Core. ACC is also the lead command for the Global Expeditionary Medical System (GEMS), and the ACC Command Core Champion developed and tested a GEMS/CCS interface that was able to transmit near real-time sensor data during a recent exercise. The ACC Command Core Champion has also submitted requirements for a follow-on project to optimize the GEMS/CCS interface and develop Command Core forward as an integrated GEMS application.

SUPPORT DESCRIPTION: The AFIERA Command Core Program Office will develop any ACC approved and funded projects to develop Command Core forward and optimize the GEMS/CCS interface as the execution agent through its established Command Core contracts. The HQ ACC/SGOP Command Core Executive Agent serves as the project sponsor and maintains the technical requirements lead during the Spiral development (rapid prototyping) phase. Following spiral development, the AFIERA Command Core Program Office will provide maintenance support through the applications life-cycle.

- database is linked to EMIS and maybe others (base specific)

- The databases are networked, but there is no main database network to access (there is no main database holding all of this information at Brooks or anywhere else). The database is networked at the base level. The databases are firewalled, but the level of security is unknown.

- GIS applications are currently under development for Command Core.

- FTP access to database

COMMAND CORE SYSTEM BACKGROUND

BACKGROUND

- Command Core System (CCS) is relational database system

- Integrates data across medical, environmental, logistics, and safety information systems

- 100% fielded at USAF installations
  -- Includes Prince Sultan Air Base

- Medical Module is part of greater ESOH integrated effort: (AF unique approach in DoD)

- System development partnership since 1996 provides funding leverage

DISCUSSION

- CCS reduces occupational health costs by providing automated data collection, storage, retrieval and analysis

- Supports health services functions for force health protection, health surveillance and risk assessment, changing environmental regulation, prevention, and health care during peacetime, at all levels of conflict, during deployment and in garrison

- Provides mature Industrial Hygiene (CCS-IH) capability
  -- Version 4.0 fielded; Defense Operational Environmental Health Readiness System (DOEHRS)-IH still developing version 1.0

- Supports AF unique Team Aerospace requirements
  -- Modules address needs of Flight Medicine, Public Health, Physical Exams and BEE

- Synergistic funding and development partnerships help ensure industry standard capability at minimal cost to taxpayer
  -- CRADA: Cooperative Research and Development Agreement leverages private investment

- Compatible with DoD systems, much more comprehensive
  -- DOEHRS systems only contain 3 modules (Industrial Hygiene (IH), Hearing Conservation (HC), and Occupational Medicine (OM))
      --- HC module fielded with old technology, audiologists having difficulty extracting AF data
      --- IH Module: initial deployment in FY00 (compromises Team Aerospace functions)
      --- OM Module still being developed

(Info Updated from January 2000 AFMOA Bullet Background Paper)

Version 4.1 Overview
page last updated 14 July 2000
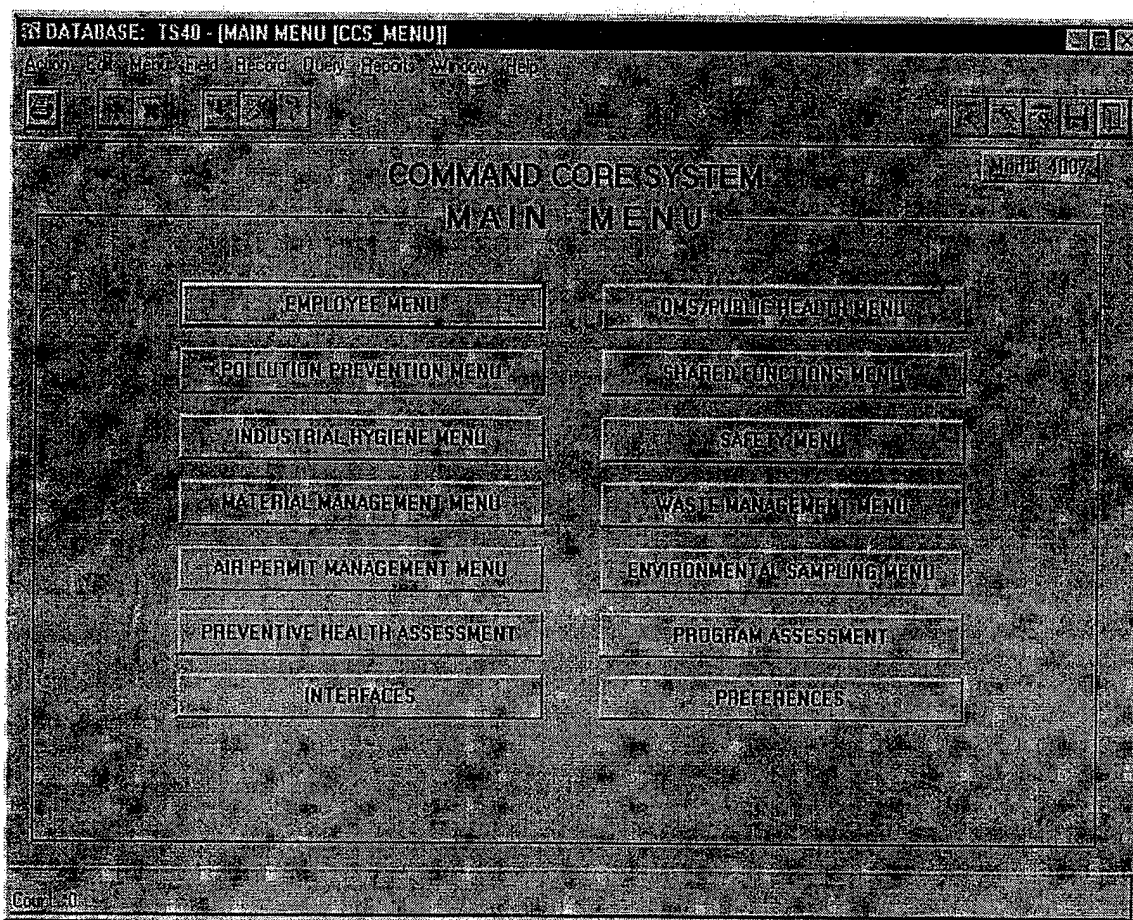
Employee Demographics Menu
Maintains basic employee information. Key information includes the social security number or other employee identifier, which is used to track an employee throughout various work assignments, medical screenings, fittings for protective equipment, etc.

Pollution Prevention Menu
Provides a method of identifying the use of hazardous materials through the review of technical documentation associated with activities/processes performed. The menu includes options to identify substances mandated for use in technical manuals, hazards associated with substance use, and information concerning treatment for exposure. It also includes a project management option to manage projects associated with identifying hazardous substance use and reducing or eliminating the use of given substances.

Industrial Hygiene Menu

Establishes Potential Exposure Groups (PEGs) to categorize employees or groups of employees that share a common set of potential exposures. You establish test and training requirements to reduce risks associated with accident or exposure. You institute controls that protect personnel by requiring respirators, hearing protection, Personal Protective Equipment (PPE), etc., based on the PEG assignment. You also track licensing requirements associated with various activities/processes and the results of surveys that monitor the environment and employee health.

Material Management Menu

Tracks material management activities by recording material constituents, material inventory, material issue (in which material is issued to a person/Potential Exposure Group (PEG) for use in a specific activity/process), and material use. It provides options to prepare information for Toxic Release Inventory (TRI) reports on chemical release. Through this menu you record complete information on chemicals tracked, including hazards they represent, and recommended treatment in cases of accidental exposure.

OMS/Public Health Menu

Maintains records of employee medical information. The menu includes screens where you record clinical test requirements based on a PEG, medical test and audiogram results, and medical testing requirements.

Shared Functions

Provides general functions needed by users of different CCS modules. These functions include screens to maintain organizational data, record accounting (with cross billing tracking) transactions, establish training course requirements and record employee attendance, monitor equipment use, track shop visits, identify unique activities/processes, and track employee work assignments.

Safety

Tracks information associated with any incident that might occur at the work site. You can report all aspects of the incident, including medical results and resultant compensation.

Waste Management Menu

Provides options to manage all aspects of hazardous waste generation, movement, and disposal. Hazardous waste includes materials that, either alone or combined, are hazardous and must be disposed of via a regulated activity/process.

Air Permit Information Management System (APIMS)

Provides an integrated information system that stores data necessary to comply with Title

V of the 1990 Clean Air Act, and TRI reporting requirements. APIMS can hold data on source categories and their sources, equipment that relates to each source and algorithms needed to calculate emissions. APIMS uses this information to calculate air emissions on the source categories or sources that are specified by the user.

Environmental Sampling Menu

Provides options to track all aspects of environmental sampling. Environmental sampling tracks the sample from the sample point through lab analysis. This menu is designed to track different types of samples including, waste water, potable water, ground water, soil, etc.

Preventive Health Assessment

Provides a capability to setup and perform preventive health assessments on employees. This module is still in development. If you wish to be a BETA site for this module, please contact the CCS help desk.

Program Assessment Menu

Provides a system for tracking of compliance assessment and management programs (CAMP). The findings of the CAMP inspection at a base will be entered into CCS and updated/tracked on a daily basis by both the Inspector General's (IG) office and the base where the inspection occurred.

Interfaces

Provides the system administrator easy access to run external interfaces to CCS from the system administrator's client.

Preferences Menu

Provides the system administrator easy access to the preferences table for setting up interface file locations, and other system and database options.

DMSS

DESCRIPTION OF DATABASE

The Defense Medical Surveillance System (DMSS) database comprises the collection of routine, systematic, standardized population-based, occupational, environmental, and health risk data.

ACCESS TO SYSTEM

Authorized users from medical and personnel arenas.

POTENTIAL DATABASE USERS

☒ Medical Intelligence   ☐ Military Intelligence   ☒ Forward Echelons

☒ Researchers/Scientists   ☐ Public Health (Base Level)   ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level)   ☒ Medical Command and Control   ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team   ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Linked to DESS as repository of personnel exposure and medical data.

SECURITY ISSUES RELATED TO THE DATABASE

Users with password accounts; Privacy Act information.

ADVANTAGES

- Established in current function
- Tri-service use
-
-
-

DISADVANTAGES

- Areal data not linked to individual(s)
- Different data sets updated at different frequencies
-
-

MEDICAL

DEFENSE MEDICAL SURVEILLANCE

SYSTEM

The development of a comprehensive military health surveillance system in which medical, environmental, occupational, and health risk data affecting health can be collected, stored, integrated, and interpreted for use in decision making.

Medical surveillance data is currently available through the Defense Medical Surveillance System. The collection of routine, systematic, standardized population-based, occupational, environmental, and health risk data needs further development. Surveillance data characterizing the agent, (medical), host (personal health risks), and environment (environmental and occupational) elements, the building blocks of preventive medicine, need better integration and analysis. The results of these analyzes need to be reported and used in policy and decision making which focus on risk-management based operational and policy decisions about disease and injury prevention and health promotion. Due to the variety of data collection systems, this process is an evolutionary one which requires a prioritized methodology for data collection, storage and the integration of the data sets in order to effectively use available resources. The interpretation, analysis, and reporting elements also need further development.

The capability to collect, integrate, store, analyze, report and transmit assessment data to track total force health is critical for military leaders; it is the foundation for force protection. A comprehensive military health surveillance system establishes a template and process for achieving this objective.

Strategies

- Disseminate current, integrated health information for decision support to commanders, policy makers and individuals who can act to influence health and prevent diseases and injuries
- Identify and evaluate existing primary data sources
- Enhance current or develop routine, systematic, standardized, population-based surveillance systems to address environmental, occupational and personal risk data affecting health
- Integrate and analyze the data of existing and new surveillance systems in a prioritized fashion
- Proliferate the use of the Defense Medical Surveillance System (DMSS), Defense Medical Epidemiological Database (DMED) and the geographic information system (GIS) technology.

Contact Information:

Chief, Army Medical Surveillance Activity
LTC Mark Rubertone, MD, MPH
Army Reportable Events Project Officer
LTC Arthur Baker, MD, MPH
Navy Liaison
LT Jeff Brady, MD, MPH
Air Force Liaison
Vacant
Address:
Army Medical Surveillance Activity Building T-20, Room 213
(Attn: MCHB-TS-EDM)
6900 Georgia Avenue, N.W. Washington, D.C. 20307-5001
Phone: (202) 782-0471 (DSN: 662)
Fax: (202) 782-0612 (DSN: 662)
E-mail: amsaweb@amsa.army.mil

Below is a table that illustrates the Data Tables integrated within the DMSS

Selected Data Tables Integrated within the Defense Medical Surveillance System (DMSS)*

Table	Source	Frequency	Rows	Services	Period of time
Person[1]	DMDC	Monthly	6.9M	All	1990 -- 2000
Demog[1]	DMDC	Monthly	61.3M	All	1990 -- 2000
MEPS	MEPCOM	Monthly	7.3M	All	1985 -- 2000
Deploy_PGW[2]	DMDC	Single	697K	All	1990 -- 1991
Deploy[3]	DMDC	Monthly	456K	All	1993 -- 2000
SIDR	EI / DS	Monthly	1.8M	All	1990 -- 2000
SIDR_DEPLOY	PASBA	Weekly	9K	All	1996 -- 2000
Deploy_Forms[4]	AMSA	Daily	328K	All	1996 -- 2000
SADR	EI / DS	Monthly	41.6M	All	1996 -- 2000
SADR_DEPLOY	DCII	Monthly	58.7K	All	1998 -- 2000
HIV_Tests[5]	Testing Labs	Weekly	25.7M	All	1985 -- 2000
Immunizations	DEERS	Monthly	11.4M	All	1980 -- 2000
DoDSR	DoDSR	Weekly	26M	All	1985 -- 2000
Casualty[6]	DIOR	Quarterly	21K	All	1985 -- 2000
HRA	CHPPM	Quarterly	572K	Army	1990 -- 2000
Reportable Events[7]	MTFs	Daily	75K	All	1994 -- 2000

Notes   * Last Updated: Feb-01
1. Person / Demog contain all persons serving on active duty and in the reserve component
2. Deployment roster for Persian Gulf War
3. Deployment roster for major deployments since PGW
4. Health assessment questionnaires administered before / after major deployments
5. Data from mandatory HIV tests performed on DoD personnel and MEPS applicants
6. Casualty data on active duty deaths
7. As outlined in the Tri-Service required list of reportable events

Acronyms:
CHPPM -- USA Center for Health Promotion and Preventive Medicine
DCII -- Desert Care II
DEERS -- Defense Enrolment Eligibility Reporting System
DIOR -- Directorate for Information, Operations and Reports
DMDC -- Defense Manpower Data Center
DoDSR -- Department of Defense Serum Repository
EI / DS -- Executive Information Decision Support
HRA -- Health Risk Appraisals
MEPS -- Military Entrance Processing Stations
MTF -- Military Treatment Facility
OJE -- Operation Joint Endeavor
PASBA -- Patient Administration Systems and Biostatistics Activity
SADR -- Standard Ambulatory Data Record
SIDR -- Standard In-Patient Data Record
SWA -- SouthWest Asia

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DOEHRS-IH

DESCRIPTION OF DATABASE

Defense Occupational Environmental Health Readiness System (DOEHRS) Industrial Hygiene application is the US Army's global management system for collection and dissemination of IH information. The system, when fully deployed, will have 547 installations with 8-10 workstations each. It replaces OHMIS.

ACCESS TO SYSTEM

The system is currently under development and external access has not been defined. 547 installations are planned with 8-10 workstations each.

POTENTIAL DATABASE USERS

☐ Medical Intelligence   ☐ Military Intelligence   ☐ Forward Echelons

☐ Researchers/Scientists   ☒ Public Health (Base Level)   ☐ AFIERA

☒ Bioenvironmental Engineering (Base-level)   ☐ Medical Command and Control   ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team   ☒ Medical Treatment Facilities

DATABASE USE SCENARIOS

Could work in conjunction with CCS/GEMS or in place of CCS if development is continued to add environmental applications and interface with GEMS.

SECURITY ISSUES RELATED TO THE DATABASE

This database has as yet undefined external user access.

ADVANTAGES	DISADVANTAGES
▪ Interfaces with CHCS II ▪ Supported by the Army ▪ ▪ ▪ ▪ ▪	▪ System still under construction ▪ Unknown interface with CSS/GEMS ▪ ▪

MEDICAL

**Defense Occupational Health
Readiness System (DOHRS)
Industrial Hygiene Application**

Critical Design Review
4/14/99

Agenda

Opening	9:00	Monk
Introduction	9:00 - 9:15	Brandyberry
Project Background, Status, and Schedule	9:15 - 9:30	Brandyberry
System Architecture Overview	9:30 - 10:00	Lewthwaite
Hardware Architecture	10:00 - 10:30	Lewthwaite
Break	10:30 - 10:45	
Database/Data Architecture	10:45 - 11:15	Walters
Software Architecture Overview	11:15 - 12:00	Lewthwaite
Lunch	12:00 - 1:00	
Graphical User Interface Demonstration	1:00 - 1:30	Mansfield
Software Architecture Details	1:30 - 2:30	Lewthwaite
External System Interfaces	2:30 - 2:45	Mansfield
Wrap Up	2:45 - 3:00	Brandyberry

CDR - Introduction

- The CDR is being held at this point in the design to validate both the overall system design, as well as the software component architecture
- Core architecture defined
- Database design maturing

Background

- Requirements definition and code development have been iteratively approached
- Began requirements clarification in October 1998
  - Held 7 meetings of the IH Functional Working Group through February 1999
- Began initial architecture design based on technical requirements, and had PDR on 12/10/98
- Began GUI prototype development in January 1999
  - Assembled IH Field User's Group in March 1999

Current Status

- Currently:
  - Finalizing functional requirement clarification document
  - Refining and completing GUI concept
  - Completing system and high-level software architecture
  - Allocating functional requirements to remaining code modules

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Status (con't)

- Infrastructure code nearing completion, based on original technical requirements
  - Basic application shell, communications, other major components
- Attempting to acquire information needed to define interfaces with external demographics and hazardous materials systems.
  - Should not impact the core architecture
  - demographics format and availability have the potential to impact the database details and the GUI

Top-level Schedule

- First internal build - Mid April 1999
- Complete all major components - Late July 1999
- Test full system - August 1999
- Complete system and provide to DTE
  - Late September 1999
- Alpha - October 1999
- OTE - December 1999
- Deployment - February 2000

Included Functionality

- The functional requirements have been prioritized as "mission essential" or not
  - *Only mission essential requirements will be included in the first build of DOHRS IH*
  - OHWG voted on requirements to decide what is mission essential
  - Refined in a few cases by the IHFWG, but always returned to OHWG for approval
- All other requirements maintained, but will be in future builds

Architecture Overview

-Objectives
-Assumptions
-Overview

Architecture Objectives

- To provide a Global Information Management System for the collection and dissemination of Industrial Hygiene information
- To provide a modular, robust system easily customized, enhanced, maintained and upgraded

Assumptions

- Adequate Server and Workstation Hardware will be available at each installation
- Adequate Network capacity and reliability
- Trained System, Database, Data and Security administrators will be available to manage DOHRS servers and workstations
- 547 installations (Based on HC deployment)
- Average of 8-10 IH Workstations at each installation

Assumptions

- Servers are C2 compliant
- Workstations and servers are DII COE machines.
- Workstations and Servers have NTFS formatted disks, including the C drive.
- MHS will provide a secure infrastructure for the Regional servers
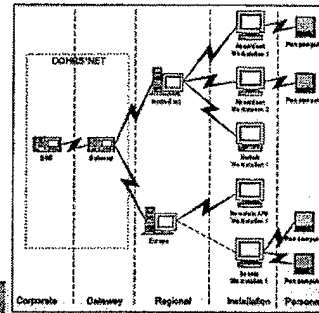- The regional servers will be under MHS control

Architecture Overview

- System is layered
- Client-Server/Stand-alone
- Regional/Gateway databases are Informix
- Client/PBC databases are MS-Access
- System will be C2 level secure
- System will be modular, ActiveX

Architecture Overview

Corporate Layers

- DSS - Corporate reporting
  - Gateway feeds DSS
  - Access through the web
- Gateway - DOHRS Hub
  - Central collection point for installation data
  - Entry point for external DOD corporate data
  - Authority on Application data, Standards...
  - No direct user access

Regional Layer

- Built around Informix Dynamic Server 7.3
- Maintains all installation data
  - Only data for the installations it serves
  - Complete copy of standard and lookup data
- Synchronized with Gateway through Informix Enterprise Replication
  - Only QA approved data moves to the Gateway
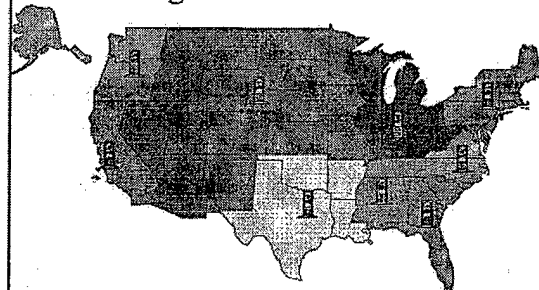- Each IH will have individual user ID and password

Regional Server Deployment

- 23 Regional Servers
- 18 - CONUS, 5 - OCONUS
  - CONUS Mid-Atlantic will serve Atlantic
  - CONUS South-West will server Central America
- Placed at network hubs
- Under MHS control, MHS will secure the infrastructure between the Gateway and Regional servers
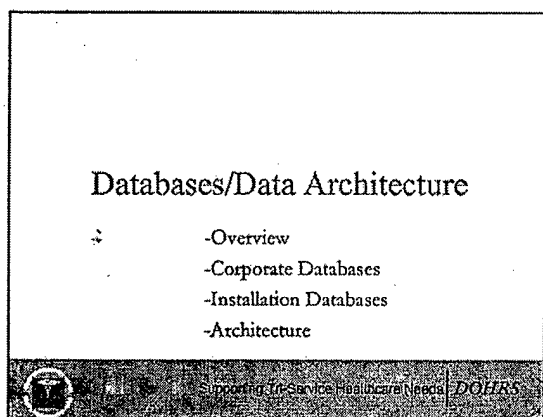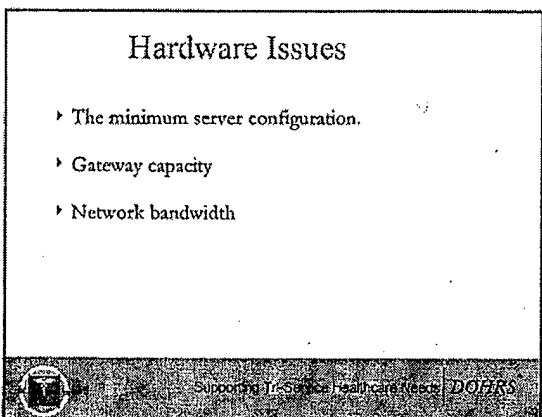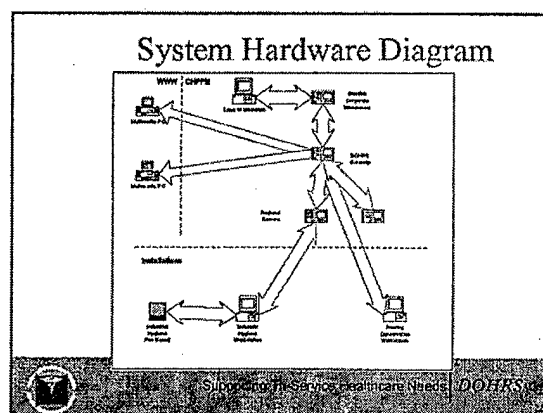
Regional Servers CONUS

Regional Servers - OCONUS

Hardware Architecture

-Overview
-Issues

Hardware Overview

- Microsoft/Intel based solution, recommendations.

Regional Server:
- Pentium II 400MHz X 4
- 16KB L1 cache
- 512KB L2 cache
- 512 MB RAM
- 20 GB user hard drive
- 3.5" disk drive
- PCMCIA card reader
- 24X CD-ROM
- 4MB video card
- Driver support for SNMP
- 15" SVGA Monitor
- 8mm 5 GB DAT tape drive

Workstation:
- Pentium II 200MHz
- 16KB L1 cache
- 512KB L2 cache
- 96MB RAM
- 3 GB hard drive
- 3.5" disk drive
- PCMCIA card reader
- 16X CD-ROM
- SVGA 4MB video card
- 10BaseT/100 network interface card
- Sound card, speakers
- 17" SVGA Monitor
- Iomega 100MB Zip drive

System Hardware Diagram

Hardware Issues

- The minimum server configuration.
- Gateway capacity
- Network bandwidth

Databases/Data Architecture

-Overview
-Corporate Databases
-Installation Databases
-Architecture

Database Overview

- 3 Informix, 2 Microsoft Access Databases:
  - Corporate Warehouse - Informix Dynamic Server 9.14
  - Data Gateway - Informix Dynamic Server 7.3
  - Regional Database - Informix Dynamic Server 7.3
  - Workstation Client Database - Microsoft Access 97
  - PBC Client Database - Microsoft Access 97

Corporate Databases

- Corporate Data Warehouse
  - The engine for the Decision Support System
  - Optimized for data retrieval, queries, and is read-only
  - Periodically updated with installation data from the DOHRS Data Gateway Database

- Data Gateway Database
  - Serves as the central collection point for all installation data via Regional Databases.
  - Serves as the central authority on DOD and application data
  - Purpose is an interim holding facility to transfer data from the Regional database to the Corporate Data Warehouse.
  - Central Entry/Exit point for external corporate data

Installation Databases

- Regional Database
  - A transaction oriented database for use by multiple installations to store and report completed survey results.
  - The central repository for installation survey data.
  - Source of pick lists and standards to be downloaded to Client Database.

- Client Database
  - Resides on workstation PCs
  - Typically will store the lookup tables, standards, in-progress surveys (completed survey results will be stored on the Regional Database)
  - During deployment the IH will be able to download survey information and store results locally to this database to be synchronized later with the Regional Database
  - Entry point for installation level data

Database Architecture

Table Architecture

Table Architecture

- Each Table tracks when the record has been changed and by who (C2 requirements).
- Major tables have lock fields to allow for deployment and to prevent modifications
  - Survey
  - SEGs

DOHRS Data Model

- FAM-D model compliant
- Major Categories of Data:
  - Hazards, Processes, Locations, SEGs, Surveys, Samples, Sample Results
  - People, UICs, Installation, Training
- Other Data Tracked:
  - IH Workload data, Materiel Items

Database Issues

- Synchronization
- Concurrency
- Security/Access
- Replication between Regional/Gateway
  - Replication part of Informix 7.3
- Interfaces to External Database Systems
  - Current interfaces to DMDC and HSMS

Software Architecture Overview

-Overview

-Architecture

-Workflow

Software Overview

- System Configuration
  - COTS and Custom Software
  - Distributed Applications (PBC, Workstation Client, Regional, Gateway, Corporate)
- Custom Software Configuration
  - Microsoft Visual Studio
  - VC++
  - Extensive use of Dynamic Link Libraries (DLL)
  - Microsoft's Component Object Model (COM).

Software Overview

- Configurable DOHRS clients
- Configurations include
  - Industrial Hygiene
  - Ergonomics
  - Global Maintenance
  - Reports
  - Synchronization

DOHRS Overview

- Application interfaces
- ESQL/DAO used for performance
- Modular for ease of upgrade and configuration
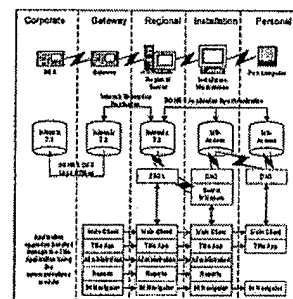
Application Architecture

- Modular architecture based on COM.
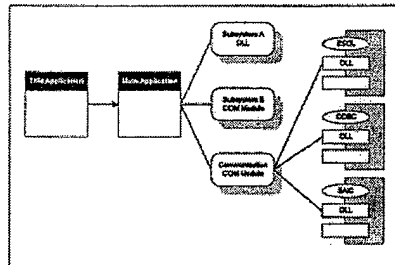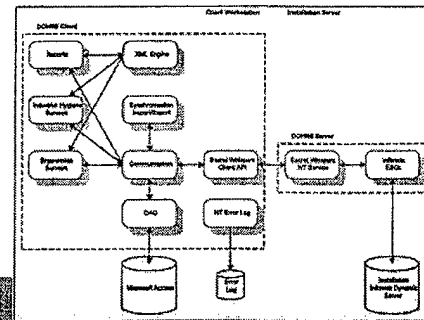
DOHRS Client-Server

Client-Server Workflow
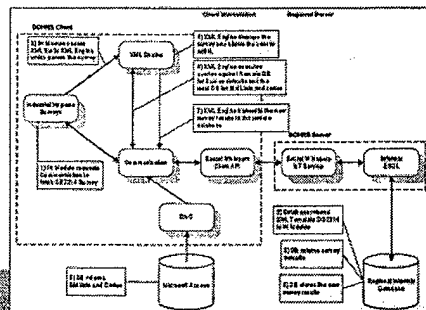
Synchronization Workflow
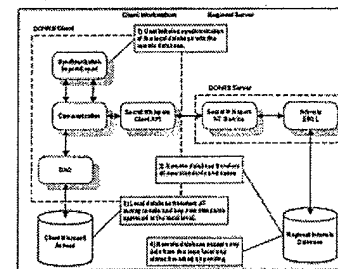
Graphical User Interface Demo

GUI

- A Visual Basic prototype has been assembled to mock up screens and functionality
  - Review DoD IH Model workflow
  - Devise system requirements for GUI
  - Explore real IH work routines
  - Identify Missing Elements
- GUI Demonstration will now be presented

Software Architecture Details

Software Components

- Title Application
- Main Application Shell
- Plug and Play Interface
- Communications
- Error Logging
- Industrial Hygiene Navigator
- XML Engine
- XML Editor
- Statistical Component

DOHRS Title Application

- Runs before the main application
  - upgrades components at runtime
  - can select whether to upgrade only, or to allow addition of new components
- Integrated safety mechanisms
  - Backs up old install before upgrading
  - Restores old install if any portion of upgrade fails
- Uses error logging to track installation problems
- Uses communications module to download new files
- User cancelable, but will try again next time
- Automatically starts IH application after completion

Title Application (con't)
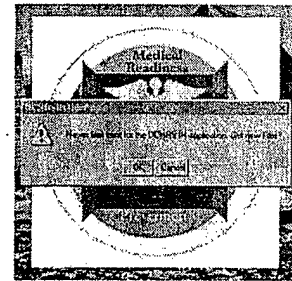
Main Application

- Framework for the DOHRS client
  - Provides toolbars, menus
- Implements the Plug And Play Architecture
- Provides Error logging and communications to the controls
- Dynamically configurable
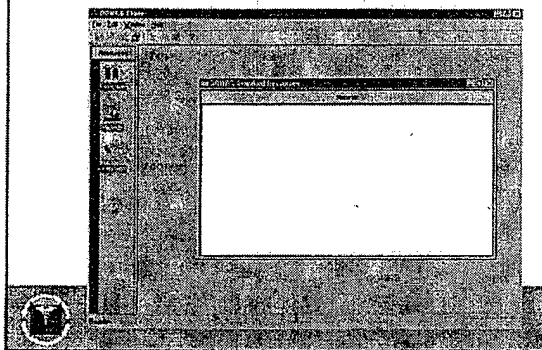- 32-bit executable built in Visual C++ & MFC

Plug And Play Architecture

- Provides a standard method for ActiveX controls to be loaded by and communicate with the Main Application
- Standard interface for all components
- Application loads all available components at startup - new components are automatically loaded and available

Main Application Shell

Communications Overview

- Provides a standard programming interface to multiple data sources
  - ODBC - general database protocol
  - DAO - Proprietary API to MS-Access
  - ESQL - Proprietary API to Informix
- Provides secure transmission, encryption
- Provides security, integrates with NT security, Unified Logon
- Provides file transfer interface using FTP

Use of Communications Protocols

- ESQL interface used for Workstation to Regional Server
  - Up to 10 times faster than ODBC
- DAO interface used for local Workstation and PBC MS Access communication
  - from 3 to 60 times faster than ODBC
- ODBC interface available for external database communications or future needs
- File transfer used by Title Application

Secure Communications

- "Secret Whispers" Windows Socket communications
  - Encrypts all transmissions to server at client end
  - Decrypts transmissions at server end using Windows NT Service running on server.
  - Reversed for server to workstation communications
- Only remote communications is encrypted

Error Logging

- Provides a unified mechanism for logging events; either errors or auditing
- Writes to multiple destinations
  - Error Log - Text log records all events
  - NT Event Log - Records Fatal & Info Events
- Level of recording user configurable
- E-Mail - Error log is integrated with E-Mail

IH Navigator

- One of the main GUI components
- Allows the hygienist to create, modify or delete all the basic IH data:
  - Shops, surveys, processes, hazards, samples, SEGs, exposures
- Basic tool for setting up work, forming relationships between data, accessing data entry forms for various data
- Uses the Windows Explorer paradigm

Navigator Structure
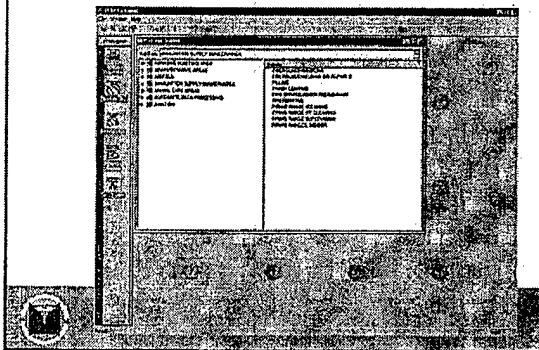
Navigator Design

- Dual-pane windows with either trees on both sides, or tree on left with Icons on right (a.k.a. Windows Explorer)
- Drag and drop within and between trees
- Data aware trees (populated by SQL in nodes)
- GUI Demonstration focused on IH Navigator
 - GUI driving Navigator development
  - business rules

XML Engine

- The predominate way that the user will enter survey data and view reports
- Presents the user with forms and screens based on custom XML scripts
- The XML engine is based on a custom XML language defined to enable IH database access, scripting, and multiple form views
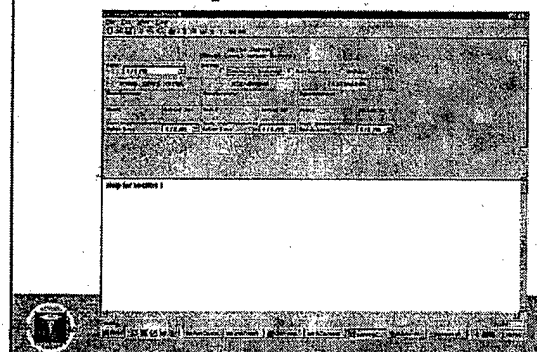
XML Engine Views

- 3-views - Form, Sectional, Tabbed
- Form view is a "WYSIWYG" view of a form
- Sectional view breaks up a form and provides on-form help
- Tabbed view breaks up the form into a tabbed dialog - may be best view for PBC
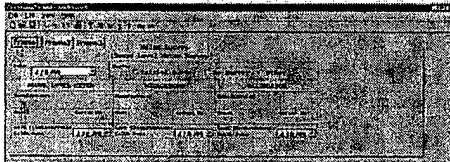- Easy for developers to customize screens - edit a text file

Example XML Form View
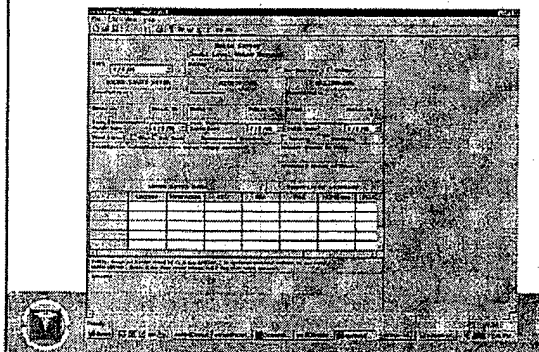
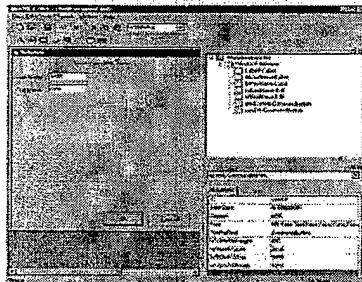## Example Sectional View

Example Tabbed View

XML Editor

- Building a custom XML editor to facilitate development of the XML forms
- Visual basic-like interface
- Uses XML engine to parse and display XML file
- WYSIWYG design view
- Not going to users, but has potential to implement user-defined forms or reports in future build

XML Editor

Statistical Component

- Basic statistical calculations are required for analyzing exposure results
- COTS package: LOGNORM II will be used, but will be modified by developer to DOHRS IH Plug and Play interface as an ActiveX component
- Normally used for calculations "under the hood" - limited needs for most applications
- Will be able to be shown at user's request to access full functionality
- Currently in process of defining required statistical interface

External System Interfaces

-Planned Interfaces
-Status
-Risks

Desired Interfaces

- Over 30 systems in requirements, but only three were planned as mission essential for the first build:

  - Occupational Medicine; exposure records (CHCS II)
  - Demographics (DMDC/DEERS)
  - Hazardous Materials Inventory (DESCIM - HSMS)

Status of Interfaces

▸ Have had difficulty retrieving information on the three planned external system Interfaces
  – Data dictionaries (have HSMS and DEERS)
  – Technical Interface Specifications
  – Existing Interfaces
  – Technical POCs to discuss interfacing with

CHCS II Status

▸ *Will not be possible to establish interface with CHCS II for first build*
  – Time lines for CHCS II are too far out
▸ Will store information in corporate data warehouse (DSS) on exposures
▸ Will provide hard-copy reports to transfer information to patient records

Demographics Interface (DMDC/DEERS)

▸ Could use DMDC or DEERS directly
▸ Mainframe based with Oracle front-end
▸ Demographics only available at a UIC level from these systems
▸ Lower-level UIC relationships may be classified
▸ Anticipate a monthly dump from one of these systems to the gateway

HSMS Status

▸ Have data dictionary; developing fields to transfer
▸ Oracle-based. Could use ODBC or a text-file dump from HSMS into local DOHRS IH workstations
▸ Trying to contact HSMS to discuss potential interfaces - POCs are inaccessible due to DTE on new HSMS

Demographics (con't)

▸ Data at the gateway would then be transferred to the regional servers, for access by site IH personnel
▸ Other possibilities are local access to Local DEERS, but data integrity problems at the DOHRS corporate rollup are a concern
▸ Web-based access to DEERS postulated, but data volumes may make this possibility unwieldy

Interface Impacts

▸ Lack of defined interfaces may impact the database design, and / or the communications models
▸ If gateway delivery of demographics is not feasible, may impact the GUI as designed for choosing UICs
▸ Need to solve these issues quickly, with minimal interfaces, to make current schedule

Wrap Up

Path Forward

- Architecture Infrastructure is almost in place
  - Core communications interface complete to both Informix and Access
  - Main interface engine structures complete
    - Application Shell
    - XML Engine
    - IH Navigator
- Most of GUI still to be implemented through IH Navigator and XML forms
- External Interfaces must be defined

GEMS

DESCRIPTION OF DATABASE

Global Expeditionary Medical System (GEMS) is a module-based Medical Surveillance System database used to integrate patient evaluation and epidemiological analysis. GEMS enables the Medical Command & Control to evaluate the health status of deployed forces and make decisions based on the data as to the problematic occurrence of medical-related threats.

ACCESS TO SYSTEM

GEMS is an individual software package with authorized access only and is password-protected.

POTENTIAL DATABASE USERS

☒ Medical Intelligence
☐ Military Intelligence
☐ Forward Echelons

☒ Researchers/Scientists
☒ Public Health (Base Level)
☒ AFIERA

☒ Bioenvironmental Engineering (Base-level)
☐ Medical Command and Control
☐ MAJCOM/SG

☐ Theater Medical Surveillance Team
☒ Medical Treatment Facilities

DATABASE USE SCENARIOS

Continued patient evaluation and epidemiological use. Interface for environmental data, through either direct input or Command Core. Patient exposure data can be archived, likely through DMSS.

SECURITY ISSUES RELATED TO THE DATABASE

Controlled access; Privacy Act data; password-protected system; classified information issues unknown.

ADVANTAGES

- Accounts for theater deployments
- Restricted access to the database
- Currently supported and in use in deployed locations
- Can be modified to accept env. data
- AFIERA has QC program
- Standardized reports available
- ACC sponsorship
- USAF ownership

DISADVANTAGES

- Requires modification to handle environmental data
- Army and Navy not using CCS
-
-

MEDICAL

The Global Expeditionary Medical System (GEMS) has proven itself as the state-of-the-art deployable health management and surveillance tool. From the individual military member to the health of the entire community, GEMS can track and identify disease in real time, manage biological and environmental threats to entire populations, and provide life-long healthcare continuity. Additionally, the Ruggedized Advanced Pathogen Identification Device(RAPID) component of GEMS is able to identify specific disease pathogens within minutes in the deployed setting."

Continue on the the GEMS Home page.

Global Expeditionary Medical System

GEMS is an improved Medical Surveillance System (MSS), (previously known as DC 1 and DC 2), GEMS allows for integration of patient evaluation, and epidemiological analysis. Medical command and control will be standardized for the first time between Air Force, Coalition Forces, Governmental agencies and civilian medical treatment facilities.

Patient Encounter Module (PEM) A paperless data linked tool for the front line medic to record individual patient assessments. Based on lessons learned from Desert Care 1 and Desert Care 2, this system will be expanded to work off a hand held palm unit in mass casualty / combat environments. This information is aggregated at progressively higher levels allowing for accurate theater assessment, epidemiological monitoring and decision making.

PEM is a streamlined medical record directed at use in the far forward deployed setting. It can synchronize with a handheld computer platform to enhance mobility and agile documentation of patient care. The PEM maps symptom complexes and diagnostic information for the deployed population database to epidemiological tracking and analysis software in a GEMS unit, and prints reports including patient encounters (SF600) for the permanent record as well as disease and injury data. Designed to have minimal footprint and support, GEMS does not require a dedicated server, and each laptop module has stand-alone capability, and can support multiple handheld platforms

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JWARN

DESCRIPTION OF DATABASE

Joint Warning and Reporting Network (JWARN) will provide near real-time operational capability for Joint Services to collect, analyze, report and disseminate NBC agent detection, identification, location and warning information. Phase I consists of commercial-off-the-shelf NBC warning and reporting software and government-off-the –shelf hazard prediction models.

ACCESS TO SYSTEM

The system is still under development. The developers plan to integrate the new network into the military's existing command, control, communications, computers and intelligence (C4I) architecture. The detection technology used by DOD's RAID teams will be integrated into the JWARN infrastructure.

POTENTIAL DATABASE USERS

☐ Medical Intelligence   ☒ Military Intelligence   ☒ Forward Echelons

☒ Researchers/Scientists   ☐ Public Health (Base Level)   ☒ AFIERA

☐ Bioenvironmental Engineering (Base-level)   ☒ Medical Command and Control   ☐ MAJCOM/SG

☒ Theater Medical Surveillance Team   ☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Front-end data collection and transmittal system linked to DESS through GEMS or CCS.

SECURITY ISSUES RELATED TO THE DATABASE

Classified data likely.

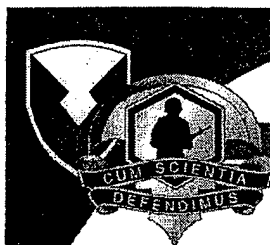| ADVANTAGES	DISADVANTAGE
- Real-time data - Compatible with Joint Services systems - Incorporates warning software and hazard prediction models - System can support monitoring for other constituents	- Unknown compatibility with GEMS and CCS - Not presently linked with personnel in potential exposure area - GIS compatibility (?)

MEDICAL

JOINT WARNING AND REPORTING NETWORK (JWARN)

Mr. Don Ramer
COM: (760) 725-2599
DSN: 365-2599
ramerdj@mctssa.usmc.mil

Operational Concept: JWARN will provide near real-time operational capability for Joint Services to collect, analyze, report and disseminate Nuclear, Biological and Chemical (NBC) agent detection, identification, location and warning information. The JWARN will also enable war fighters to respond to an NBC attack or incident, in a timely manner. Phase I, the Interim Standardization (IS) Phase, consists of Commercial-Off-The-Shelf (COTS) NBC warning and reporting software and Government-Off-The-Shelf (GOTS) hazard prediction models which immediately satisfy many of the operational requirements identified in the Joint Operational Requirements Document (JORD). Phase II will combine all the functionality of Phase I into a single software program that directly interfaces with C4I systems as well as with detector/sensor systems. JWARN will:

- Provide comprehensive analysis/planning capability to minimize effects of hostile NBC attacks/accidents/incidents
- Provide the operational capability to employ NBC warning technology which will collect, analyze, identify, locate, report, and disseminate NBC threats
- Be compatible and integrated with Joint/Service C4I systems (Phase II)
- Be located in command and control centers at levels defined by each service
- Provide additional data processing, production of plans and reports, and access to NBC information

OPERATIONAL DESCRIPTION	Phase I software applications consist of the following: • **NBC-ANALYSIS** (COTS) is used for hazard prediction warning and reporting procedures for NBC attacks based on standard NATO ATP-45 procedures. Displays NBC hazard areas resulting from use of NBC weapon systems and dissemination devices. Ability to provide hazard estimates for onset times and duration of hazard. • **Hazard Prediction and Assessment Capability (HPAC)** is a GOTS application used to predict hazard effects of NBC facility accidents and incidents and also provides an overlay of nuclear, biological and chemical hazard calculation. • **Vapor Liquid Solid Tracking (VLSTRACK)** is a GOTS application used to provide downwind hazard prediction for a wide range of chemical and biological agents and munitions. It also determines the size, shape, onset time, duration and level of hazard from an NBC attack. • **Emergency Management Information System (EMIS)/Personal Computing Program for the Chemical Hazard Prediction (D2PC)** is a GOTS application used to assess the effects of chemical agent releases of hazardous chemicals from a storage site.
TECHNICAL CHARACTERISTICS	**Phase I** Consists of the four programs listed above, bundled on CDs with maps of the world and supporting documentation. System Configuration: Pentium 133 MHz, (Win 32) **Phase I (U.S. Army Only)** NBC-ANALYSIS with a battlefield management functionality operating on Maneuver Control System (MCS) System Configuration: SUNSPARC 20 (UNIX) **Phase II**

		Combine the functionality of JWARN into a single application. Provide an interface between JWARN and detector/sensor systems and a connection to C4I systems. System Configuration: High-end PC.
	PROGRAM PERSPECTIVE	**Phase I** Fielding: 3QTR FY1998 **Phase I (U. S. Army Only)** Fielding: 4QTR FY1999 **Phase II** Fielding: FY2001

Joint Warning and Reporting Network (JWARN)

Description: The Joint Warning and Reporting Network (JWARN) consists of software and hardware components that link NBC detectors to tactical communications for NBC warning, reporting, and battlefield management.

Mission: Provide joint forces with a comprehensive NBC warning, reporting, and analysis capability
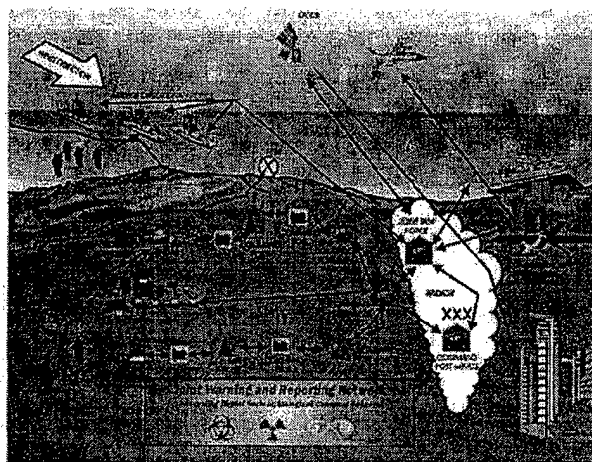
User: U.S. Marine Corps (Program Lead), U.S. Army, U.S. Navy, and U.S. Air Force

Capabilities:
- NBC warning and reporting
- NBC battlefield management
- Integration of NBC detectors to the C412 network

First Time Capability:
- Block I: NDI COTS/GOTS products to standardize NBC warning and reporting
- Block II: Competitive EMD/production effort
- Block III: Software Upgrade

Additional information on this system can be obtained by directing your inquiries to the Program Director-Detection, ATTN: AMSSB-PM-RNN/Ms. Donna Shandle, Aberdeen Proving Ground, MD 21010-5424. Ms. Shandle can also be contacted by email (donna.shandle@sbccom.apgea.army.mil), by telephone at (410) 436-4055 or DSN 584-4055, or by fax to (410) 436-1383.

Rev. 01-16-01

MRER

DESCRIPTION OF DATABASE

The Master Radiation Exposure Registry (MRER) database is the USAF Master Radiation Exposure Registry, which documents personnel's radiation exposure history. The data in this database only applies to personnel who are enrolled in the USAF Personnel Dosimetry Program.

ACCESS TO SYSTEM

Users can access the MRER through MS Access® via the Internet. An effort is currently underway to link the MRER to the Command Core System.

POTENTIAL DATABASE USERS

☒ Medical Intelligence

☒ Researchers/Scientists

☒ Bioenvironmental Engineering (Base-level)

☐ Military Intelligence

☐ Public Health (Base Level)

☐ Medical Command and Control

☐ Theater Medical Surveillance Team

☐ Forward Echelons

☒ AFIERA

☒ MAJCOM/SG

☐ Medical Treatment Facilities

DATABASE USE SCENARIOS

Link to Command Core System and FLARE, if deployed.

SECURITY ISSUES RELATED TO THE DATABASE

The level of security for access to the MRER is the Privacy Act.

ADVANTAGES	DISADVANTAGES
• Populated database • MS Access®-based database • Secure field data transmission abilities • Data from 1960s-present • Data currently provided to DMSS • Centralized management • Exposure data linked to individual by SSN	• Time-consuming reporting back to RSO • QC difficult

MEDICAL

MASTER RADIATION EXPOSURE REGISTRY

- 7.6 million records, 50 columns
- SQL queries; ACCESS interface
- Output:
  - FLARE
  - Mobile dosimetry unit
  - Read out on site, accredited
  - 6 people, 1000 badges per day
- Reports to medical commander in field daily
- Can export files back on secure line or load upon return
- Heat stress information within 10 mile radius
  - NGB electronic dosimetry
  - Siemens
  - Suitcase sized reciever
  - Alarm capability
- Realtime being researched
- ACC/CEX response to accidents
  - Deploy electronic dosimeters to first response personnel

Currently not linked but will be to Command Core System. Database is networked (Internet) and level of security is Privacy Act.

TMIP

DESCRIPTION OF DATABASE

Theater Medical Information Program's (TMIP) purpose is to integrate/develop information systems to capture the medical record and link all theater echelons of care in an integrated, interoperable fashion to provide enhanced medical care to the fighter.

ACCESS TO SYSTEM

Users with access to TMIP include both medical providers and Medical Command & Control personnel.

POTENTIAL DATABASE USERS

☒Medical Intelligence   ☐Military Intelligence   ☐Forward Echelons

☒Researchers/Scientists   ☒Public Health (Base Level)   ☒AFIERA

☒Bioenvironmental Engineering (Base-level)   ☐Medical Command and Control   ☐MAJCOM/SG

☐Theater Medical Surveillance Team   ☒Medical Treatment Facilities

DATABASE USE SCENARIOS

Upon system deployment, TMIP may be linked to DESS as an analysis and cross-reference tool. May work in conjunction with or replace parts of GEMS/DMSS if duplicative.

SECURITY ISSUES RELATED TO THE DATABASE

Authorized access only; Privacy Act; classified information considerations unknown.

ADVANTAGES

- Tri-service participation planned
- Includes comprehensive information including immunization tracking
- Reference component
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DISADVANTAGES

- Not currently operational
- May overlap with GEMS/DMSS
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MEDICAL

THEATER MEDICAL INFORMATION PROGRAM

TMIP Defined: The Theater Medical Information Program is a Military Health System (MHS) program with participation from the Office of the Assistant Secretary of Defense for Health Affairs, Air Force, Army, Navy, Marines, United States Transportation Command and Joint Staff/J4 Medical Readiness Division. The program's primary purpose is to integrate/develop medical information systems to capture the medical record and link all theater echelons of care in an integrated, interoperable fashion to provide enhanced medical care to the warfighter. TMIP's software will be used on the GCCS/GCSS infrastructure and computer hardware provided by the Services and will allow the warfighter to monitor and maintain medical situational awareness within the theater. TMIP is being developed using a building block approach and at maturity will support the following functional areas:

° Medical Command and Control (including medical capabilities assessment/sustainability analysis and medical intelligence)
° Medical Logistics (including blood and blood product management)
° Patient Movement
° Health Care Delivery (including medical surveillance and medical threat)
° Manpower, Personnel, Training and Resources

Coming Soon to a Theater Near You:
TMIP Block 1 is the first step in providing seamless, integrated, and automated medical information to the warfighter. Block 1 will provide critical functionality in Medical Command and Control, Medical Logistics, and Health Care Delivery. Block 1 is currently scheduled to begin operational testing in late CY2000.

Block 1 Components:

- **Composite Health Care System-NT (CHCS-NT):** Provides patient/provider administration and supports pharmacy, radiology, laboratory and facility reporting functions within a level III facility.
- **Defense Blood Standard System (DBSS):** Provides for the management of blood and blood products.
- **Defense Medical Logistics Standard System-Assemblage Management (DMLSS-AM):** Provides tools for logistics management.
- **Immunization Tracking System (ITS):** Provides data collection profiles, reports and queries for immunization tracking.
- **Lower Echelon Reporting and Surveillance Module (LERSM):** Provides situational awareness, patient tracking and medical surveillance functions.
- **Medical Analysis Tool (MAT):** A planning tool that incorporates a medical requirements generator (RG) and course of action analyzer (COAA) to support medical planning and programming.
- **Medical Surveillance System (MSS):** Provides situational awareness, patient tracking and medical surveillance functions (linked to LERSM).
- **Medical Reference Component (MRC):** Provides medical information database similar to the Physicians Desk Reference.
- **Medical Surveys Component (MSC):** Provides health assessment survey documentation.
- **Patient Encounter Module (PEM):** Provides clinical encounter documentation to include diagnosis coding, procedure coding, and retrieval of patient theater medical history.
- **Radiation Exposure and Occupational Health Module (REOHM):** Provides analysis and management of radiation exposure and occupational health in theater.

TMIP Objectives:

° Provide information linking all echelons of medical care in support of time-sensitive decisions critical to the success of theater through integration with the Global Command and Control System (GCCS) and Global Combat Support System (GCSS).
° Provide support integrating medical capabilities under a joint concept of operations to assist the medical commander/theater surgeon and to support the delivery of seamless combat medical care.
° Support field medical operations and decision making concerning theater medical capability by providing integrated health decision support systems to assure readiness for mission execution.
° Support all echelons of care through an aggregation of medical data and situational reports that serves the theater of operations as well as the Continental United States (CONUS) sustaining base medical missions.

Responsibilities

➢ *Works with Program Management Office to ensure systems meet requirements of functional community*

➢ *Serves as principal liaison with the functional community*

➢ *Responsible for requirements process (identification, validation, coordination, approval, integration, prioritization and funding)*

➢ *Serves as liaison to the Functional Proponent Steering/Work Groups*

➢ *Coordinates functional requirements within and across business areas*

➢ *Implements Benefits Management and Evaluation Program*

➢ *Prepares economic analyses and develops functional models as required*

Mission

The mission of Theater Functional Area is to provide information management services and products via a global communications network to military medical forces employed in contingencies ranging from major war, humanitarian assistance and man-made and natural disasters. The program uses an integrated suite of systems that enable military medical leaders to gather information and make decisions in the key areas of command and control, health care delivery (to include medical surveillance), and medical equipment and supplies. The major benefit is the protection of the health of our uniformed men and women anywhere in the world at any time.

Vision

Be the role model for Functional Area operations in the Military Health System by expeditiously integrating the requirements of the Commanders-in-Chiefs and Service Secretaries into the Theater Medical Information Program while executing superior leadership in core competencies of command and control, health care delivery, patient movement and medical logistics.

Theater Medical Information Program

TMIP MISSION NEED STATEMENT

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TMIP Program Definition

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1. Defense Planning Guidance Element. This need responds to the guidance contained in the Department of Defense Planning Guidance (DPG) FY 1997-2001; ASD(HA) Memorandum, 31 Mar 95, *Medical Program Guidance, FY* 1997-2001; ASD(HA) *DoD Corporate Information Management Strategic Plan and Enterprise Integration Implementing Strategy,* Goals 2, 3, and 4; the Military Health Services System Automated Information Systems Plan: ASD(HA) *Medical Readiness Strategic Plan 2001,* 20 Mar 95.

2. Mission Analysis.

a. Mission. The mission of the Theater Medical Information Program (TMIP) is to provide integrated automation of the theater medical environment. TMIP will provide for information linking all echelons of medical care to the theater commanders in support of time-sensitive decisions critical to the success of theater operations. In addition, TMIP will provide support integrating medical capabilities under a joint concept of operations to assist the medical commander/theater surgeon and to support the delivery of seamless combat medical care. TMIP will support field medical operations and decision making concerning theater medical capability by providing integrated health decision support systems to assure readiness for mission execution. TMIP will support all echelons of care through an aggregation of medical data and situational reports that serves the theater of operations as well as the CONUS sustaining base medical missions. The TMIP goal is to provide a global capability linking information databases and integration centers that are accessible to the warfighter, anywhere, anytime, in any mission. TMIP establishes the means and a standard for tying existing, developing, and future medical information systems (software and equipment) into an interoperable system that supports Theater Health Services. TMIP will provide seamless, integrated, automated medical information addressing all functional areas including command and control (including planning functions), medical logistics, blood management, patient regulation and evacuation, medical threat/intelligence, health care delivery, manpower/training, and medical capabilities assessment and sustainability analysis.

b. Shortfalls/Deficiencies. The Theater CINCs, Joint Task Force (JTF) Commanders, or their medical support activities have not had the data they need to make informed and timely decisions

regarding Theater Health Services. Specific deficiencies are: inadequate automated command and control (C^2) systems, insufficient interoperability, limited electronic data collection, and inadequate communication support.

c. **Timing of Need.** Current medical support systems' capabilities can marginally support current medical operations at a high cost and with limited flexibility. The timing of this need is based on emerging digital technologies and advanced technology demonstrations which have shown that integrating these information management technologies in the mission area will significantly improve theater military health care.

d. **Proposed Process Improvements.** The TMIP will enhance the effectiveness and efficiency of operations by providing timely and accurate essential elements of information to all decision makers. It will provide the ability to quickly and accurately evaluate the status of medical support and the supportability of operational plans. Medical capability assessment and sustainability analysis answers the following questions: what is the requirement, what is the capability, what is the readiness of the capability, what is the trend, and what is the current medical support status/posture?

- TMIP will serve medical decision makers at all levels including the operational medical units, warfighting CINCs, JTF Commanders, the Military Services, the Joint Staff, and OSD through an integrated set of information systems.
- TMIP will support field medical operations and decision making concerning theater medical capability by providing integrated health decision support systems to assure readiness for mission execution.
- TMIP will support all echelons of care through an aggregation of medical data and situational reports that serves the theater of operations as well as the CONUS sustaining base medical missions.

3. Non - materiel Alternatives. None. Doctrine, training, leadership, and organization have been reviewed for possible solutions. There are no non-materiel solutions that completely satisfy the requirement.

4. Potential Materiel Alternatives.

a. Adapt/modify existing military standard software and equipment to satisfy the need.

b. Adapt/modify commercial software and communication/electronic equipment to satisfy the need.

c. Develop software and communication/electronic equipment to satisfy the need.

d. Combine elements of paragraphs 4.a.-c., above, to satisfy the need.

5. Constraints. Mission needs must be met with no degradation of current MHSS capability. Standardization efforts will conform to existing standards and future guidelines intended to evolve DoD's automated architectural standards.

a. **Logistics.** This capability will be met with either associated items of support equipment to medical materiel sets and/or medical equipment sets, or stand-alone items. Capabilities must conform to standard DoD supply and maintenance policies and procedures. Contractor maintenance may be used where required.

b. **Transportation.** All items must be transportable by organic or support transportation assets.

c. **Manpower and Personnel.** No new military occupational specialties are required; however, additional skill identifiers may be required.

d. **Training.** Introduction of the capability will require institutional and individual training. Training will be integrated into existing courses. The requirement for new equipment training at fielding will be evaluated on a case-by-case basis. If needs for training devices are shown through analyses they must be documented in the operational requirements document (ORD) and developed, tested, and fielded concurrently with the equipment or systems.

e. **Command, Control, Communications, and Intelligence Interface.** The fielding of this capability will have an impact upon these areas. The impact will be evaluated on a case-by-case basis as each technology is developed.

f. **Standardization and Interoperability.** TMIP will comply with applicable information technology standards contained in the Joint Technical Architecture (JTA).. TMIP will comply with the Defense Information Infrastructure (DII) Common Operating Environment (COE) and will be interoperable within the environment of the Global Command and Control System (GCCS) and the Global Combat Support System (GCSS). TMIP will be administered in accordance with Defense Messaging System (DMS) standards. .

g. **Operational Environment.** This capability must operate in the same climatic conditions as the supported combined Armed Forces. Nuclear, biological, and chemical survivability will be evaluated for each technology fielded.

h. **Security.** Common security practices must be utilized in the development and the operation of TMIP. The security for TMIP will be administered in accordance with the following regulations and instructions:

DOD Regulation 5200.1, DOD Security Program

DOD 5200.2, DOD Personnel Security Program

DOD 5200.28, Security Requirements for Automated Information Systems

DOD C-5200.5, Communications Security

6. **Joint Potential Designator (JPD).** Joint program with the Army, Navy and Air Force.

TMIP PROGRAM DEFINITION

- **Ensure medical systems achieve connectivity through GCCS/GCSS common operating environment, of which TMIP is a component**
- **Integrate automation of theater medical systems horizontally**
- **Link all echelons of care vertically to meet theater C2 requirements**
- **Support theater surgeon with seamless medical information**